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August/September 1984
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Commodore User Groups: Who Needs Them and What Do They Do?

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Running a User Group Software Library

Incorporating Your User Group

Exclusive Interview with Jim Butterfield

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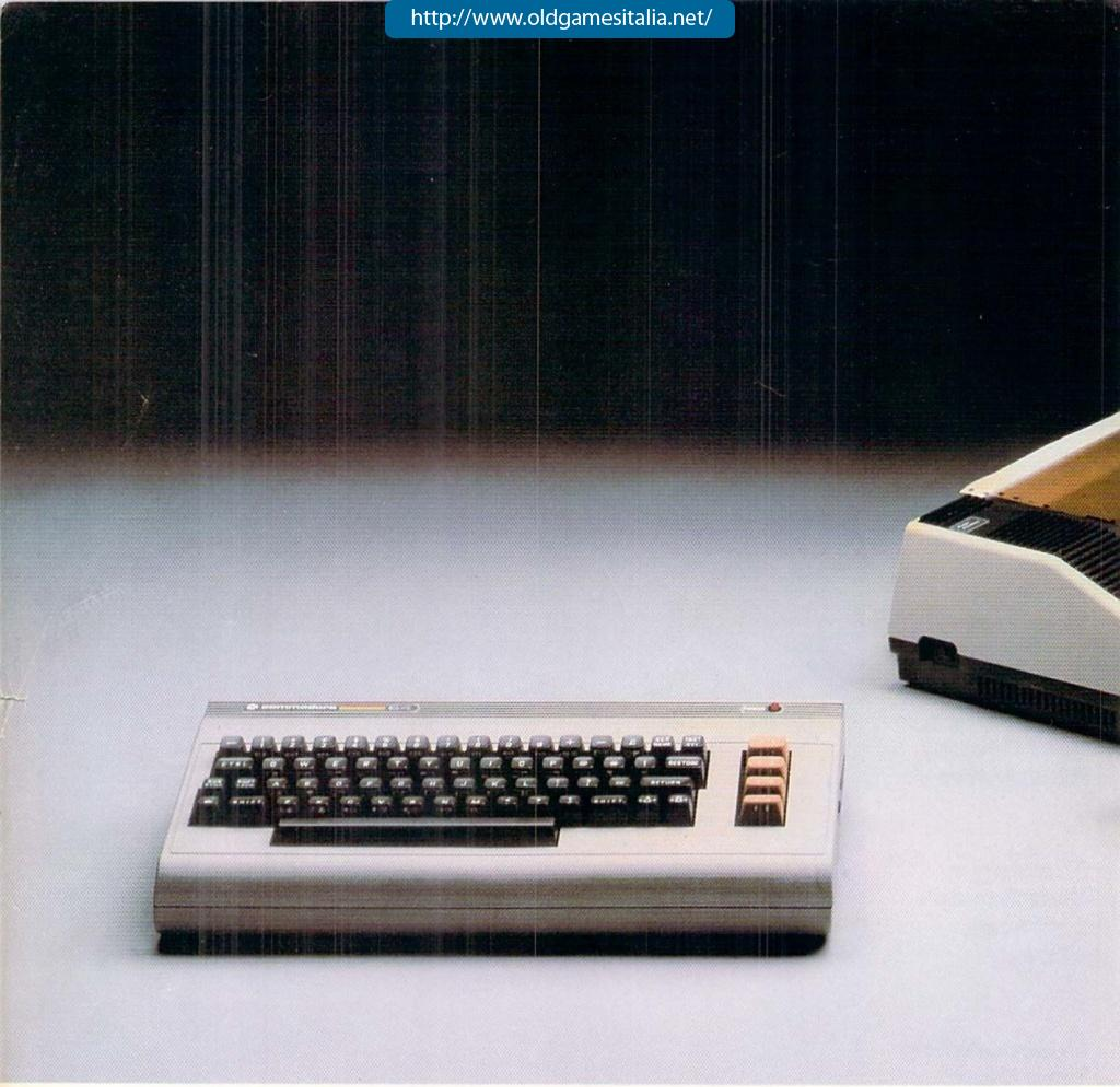

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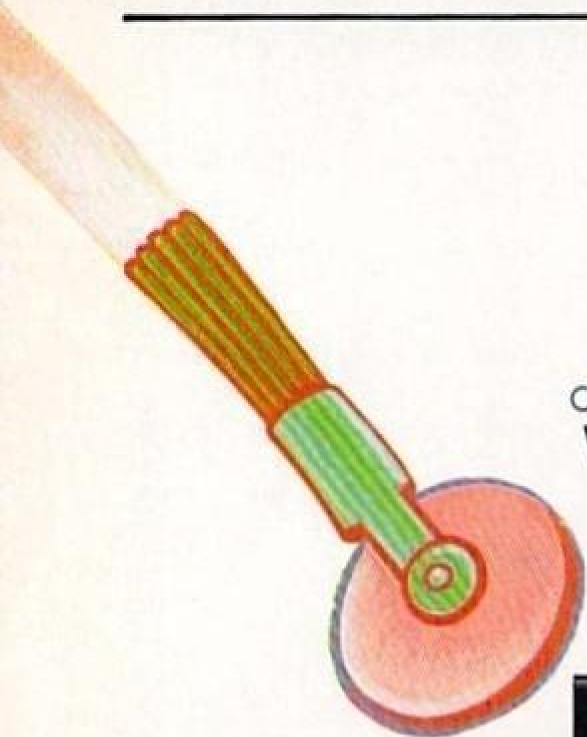

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VIC REVEALED
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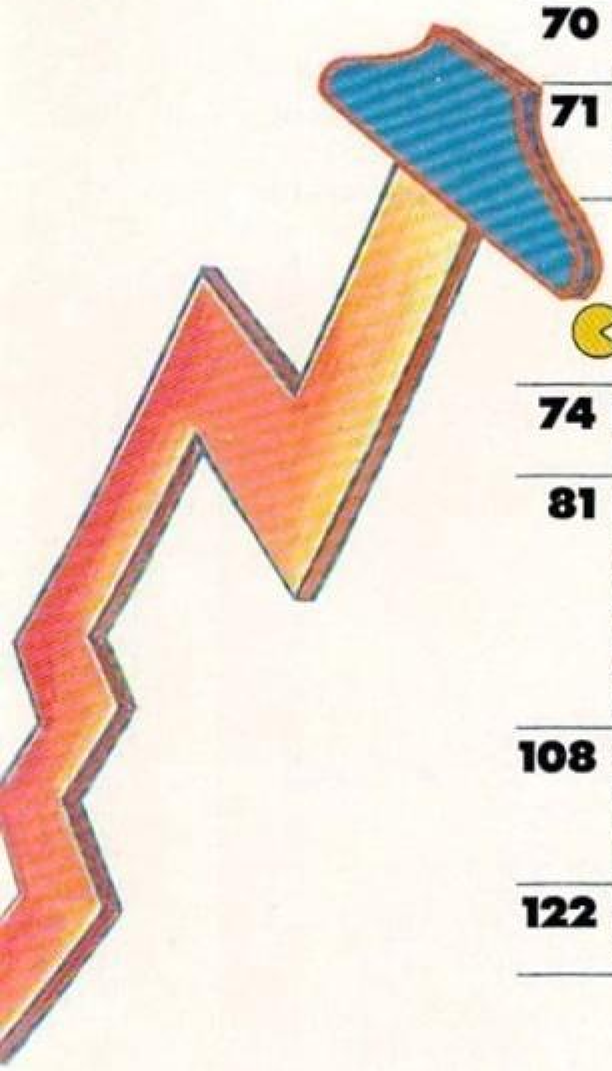

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Coming Next in Commodore's User Magazines

Commodore Microcomputers, Issue 31, September/October: Productivity software is the feature topic for our next issue. Find out which word processors, database managers, spreadsheets and accounting packages are out there for your computer and, most importantly, which ones are best for YOUR needs and pocketbook.

Power/Play, Issue 11, October/November: Commodore Kids—they're an extraordinary group. Find out who they are and what they're up to in this exciting issue. Whether they're winning prizes in international science fairs or simply running a user group, our kids are gaining skills and setting standards that will affect all of our futures.

Key to Entering Program Listings

```
"[F1,F2,F3,F4,F5,F6,F7,F8]":F1,F2,F3,F4,
  F5,F6, F7 AND F8
"[POUND]":ENGLISH POUND
"[PI]"PI SYMBOL
"^":UP ARROW
"[HOME]":UNSHIFTED CLR/HOME
"[CLEAR]":SHIFTED CLR/HOME
"[RVS]":REVERSE ON
"[RVOFF]":REVERSE OFF
"[BLACK,WHITE,RED,CYAN,MAGENTA,GREEN,BLUE,
  YELLOW]" THE 8 CTRL KEY COLORS
"[ORANGE,BROWN,L. RED,GRAY 1,GRAY 2,L.
  GREEN,L. BLUE, GRAY 3]": THE 8
  COMMODORE KEY COLORS (ONLY ON THE 64)
GRAPHIC SYMBOLS WILL BE REPRESENTED AS
  EITHER THE LETTERS SHFT (SHIFT KEY) AND
  A KEY:"[SHFT Q,SHFT K,SHFT V,SHFT T,
  SHFT L]"
  OR THE LETTERS CMDR (COMMODORE KEY) AND
  A KEY:"[CMDR Q,CMDR H,CMDR S,CMDR N,
  CMDR O]"
IF A SYMBOL IS REPEATED, THE NUMBER OF
  REPITITIONS WILL BE DIRECTLY AFTER THE
  KEY AND BEFORE THE COMMA:"[SPACE3,
  SHFT S4,CMDR M2]"
```

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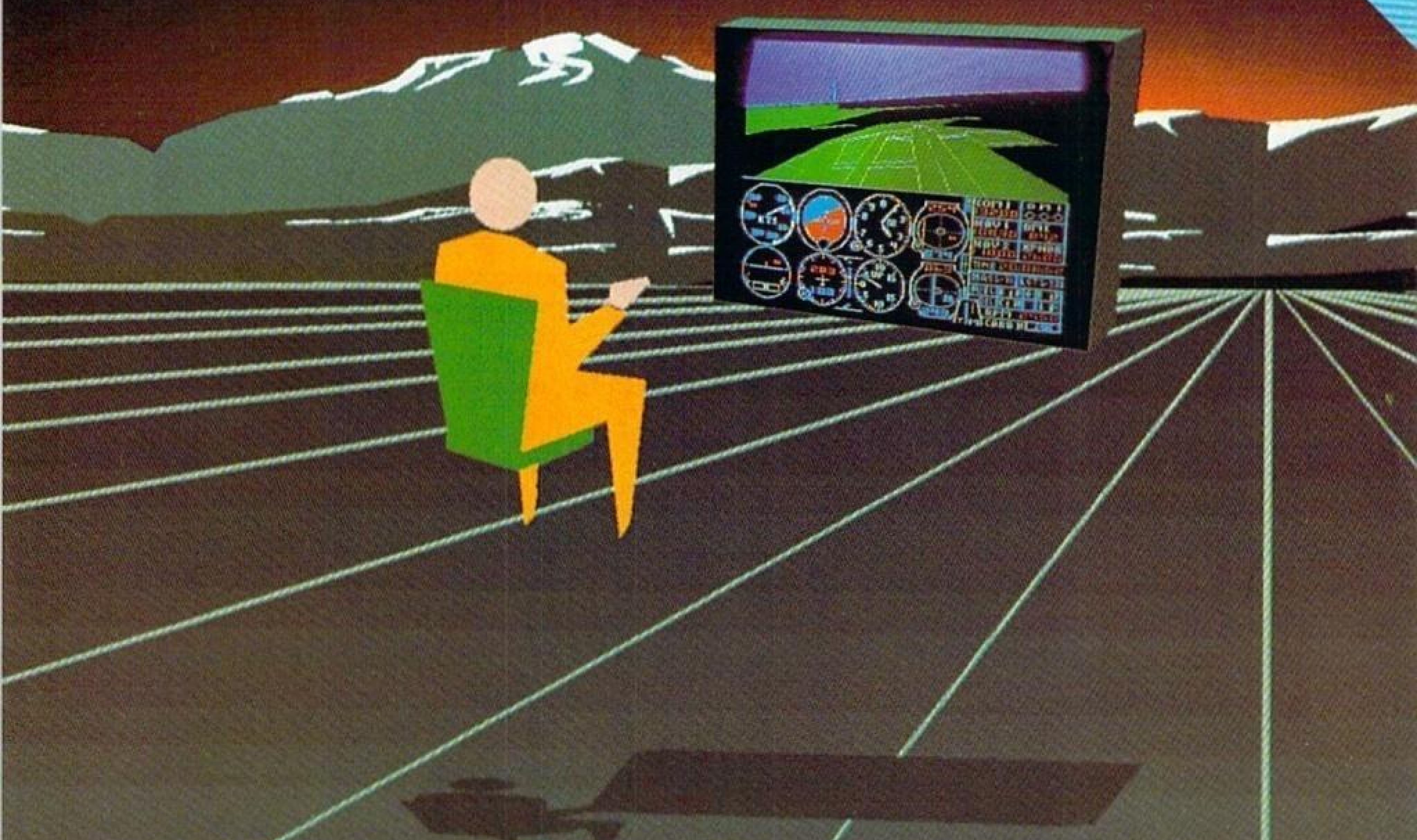

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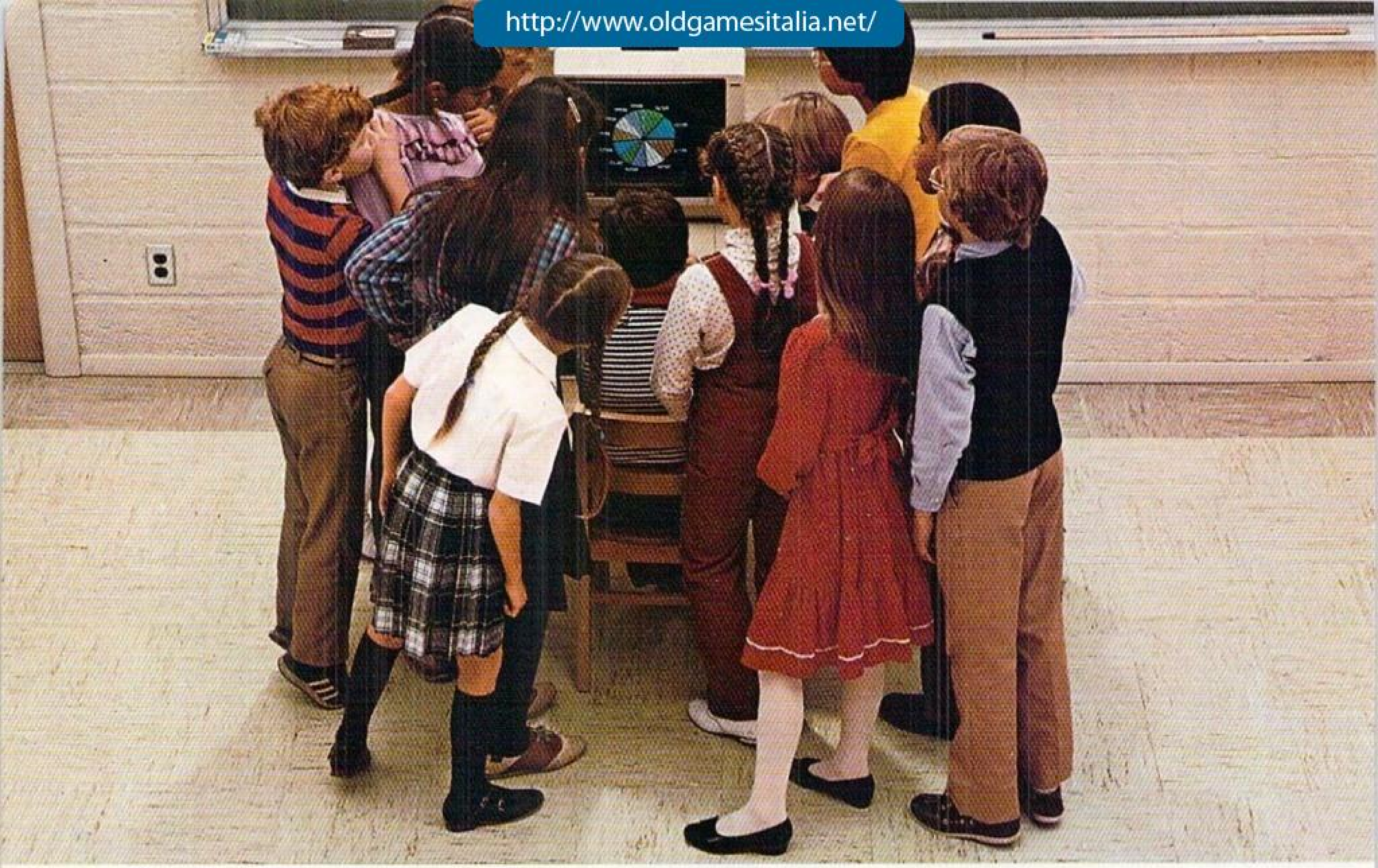
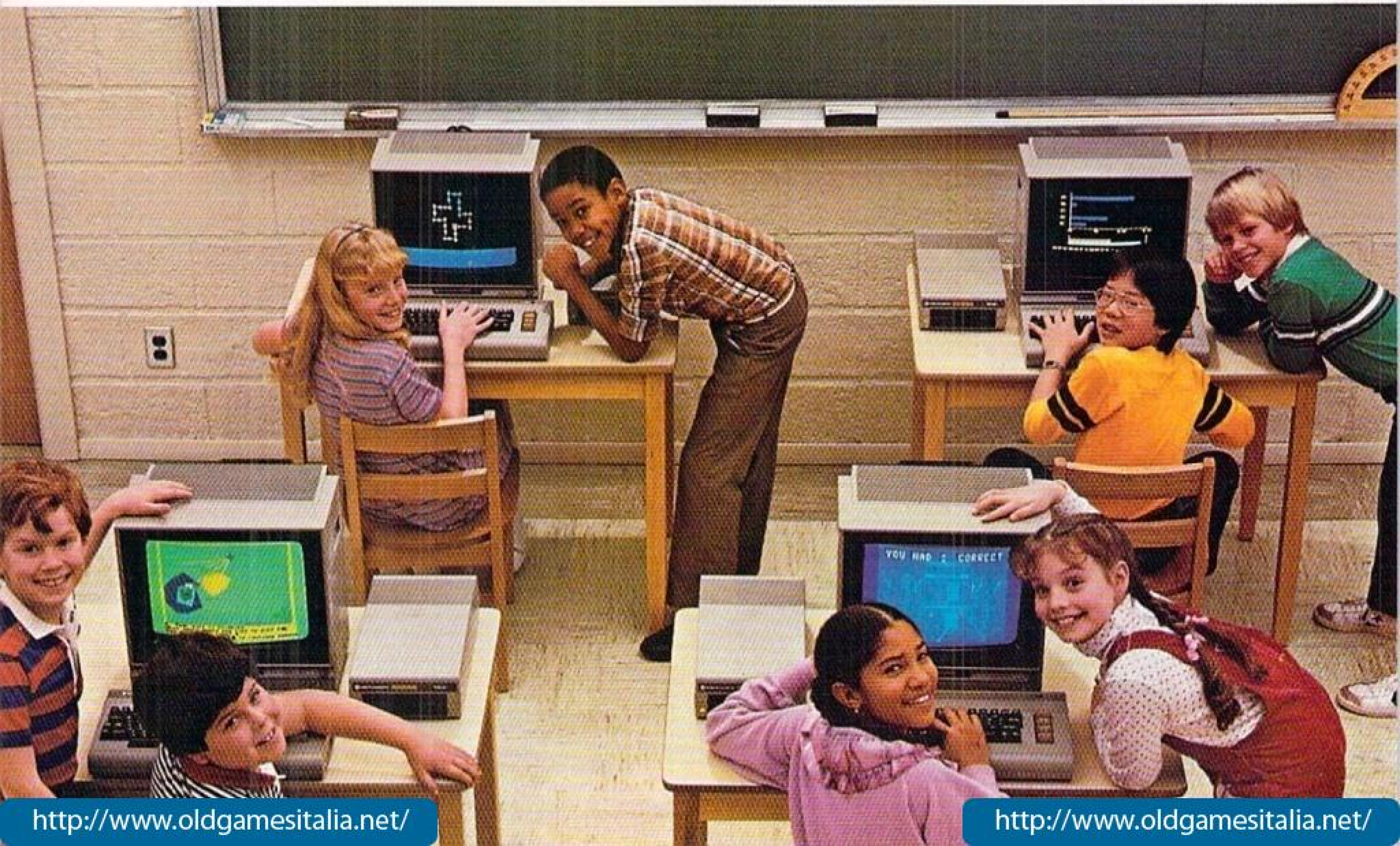


WHY THE COMMODORE 64 ISN'T IN A CLASS BY ITSELF.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departments
letters

Readers Improve on Our Programs

To the Editor:

In "A First Look at Logo", Summer 1983, David Malmburg included a program which converts English to Pig Latin. He stated that a comparable program in BASIC "would have taken much, much longer to write and would have been much more complicated." I would like to point out that my BASIC Pig Latin Program is neither long nor complex; and it is, as nearly as I can tell, BASICly the same as Mr. Malmburg's LOGO Program.

Keith Golden
Ventura, California
Program Attached

```
0 REM BASIC PIG LATIN PPROGRAM
1 INPUT A$:DIM A$(100):L=LEN(A$)
  :FOR T=1 TO L:A$(X)=A$(X)+MID$
  (A$,T,1)
2 IF MID$(A$,T+1,1)=" "THEN X=X+1
  :T=T+1
3 NEXT:FOR T=0 TO X:V$="AEIOU"
  :FOR K=1 TO 5:IF LEFT$(A$(T),
  1)=MID$(V$,K,1)THEN 5
4 NEXT K:PRINT MID$(A$(T),2,
  LEN(A$(T)));LEFT$(A$(T),1);
  "AY ";:NEXT T:END
5 PRINT A$(T);"AY ";:NEXT T
```

To the Editor:

Although I thought the "Sheriff" program in the "Jiffies" column (Fall, 1983) was interesting, I felt it was missing something. Try adding these lines for some sound effects:

Troy Goudy
Parkesburg, West Virginia

```
395 GOSUB 600
485 GOSUB 600
600 POKE 36877,146
605 FOR L=15 TO 0
    STEP-1
610 POKE 36878,L
615 FOR M=1 TO 10
620 NEXT M
630 NEXT L
635 POKE 36878,0
640 RETURN
```

To the Editor:

I am writing to tell you how impressed I am with 13-year-old Kevin Kostrzewa's work in writing "Alpha Type", (Spring, 1984). This is an excellent program and (so far, at least) all the POKEs, etc., are beyond me. However, I do have a couple of suggestions for corrections and improvements.

In line 34, the word "HOME" should be "CLEAR". Otherwise, when you answer "no" to the instruction question, the "Difficulty Level (9-1)" prints over Kevin's logo.

Line 36 should be changed to "... then run" or "... then 34"; otherwise the program hangs up if you've entered an illegal number for the Difficulty Level.

Line 44 requires a period at the end of the sentence.

Lines 184 and 186 should be repeated a third time (line 185) to line up everything on the screen.

I replaced Kevin's spaces with TAB(nn) prior to the end of the instruction text.

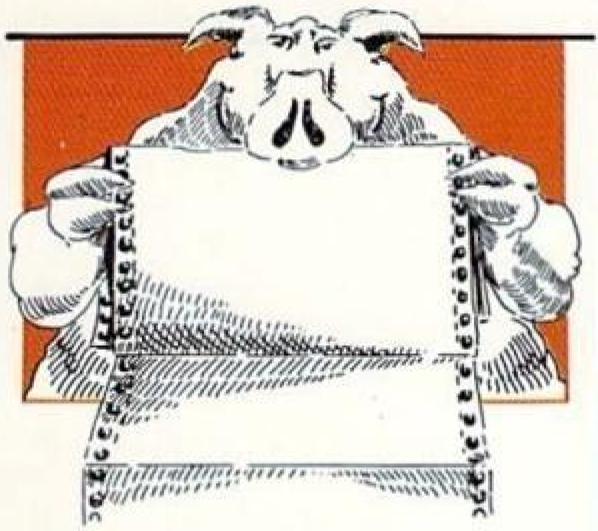
No matter which Difficulty Level you have entered, Kevin's line 174 will show a "Level 1" and inserting a variable "Z", adjusting the space lengths, etc., to compensate, and then added "Z=VAL(A$)" line 36.

I found that Kevin's line 140 changed the LEVEL number on the screen during play according to the score, so I removed the PRINT statement from line 140.

And lastly, my nine-year-old daughter is just beginning typing and is not familiar with the keyboard yet, and Kevin's program was much too fast starting out in any Difficulty Level. So I modified the program so that the higher the Difficulty Level number, the slower the program starts out. I did this by changing line 114 from:

FOR L = 1 TO LE:NEXT
to
FOR L = 1 TO LE*FP:NEXT

Now, rather than being frus-



trated and turned off, she is fascinated, and getting down right good at it. She leaves the console after a particularly rousing session whoofing and snorfling, with sweat pouring off her brow, and ready after a short break to have another go.

Don L. Kline
New Castle, California

Prison User Group

To the Editor:

We are a newly formed user's group. At present there are five Commodore 64's and five VIC 20's in our group. Our storage and retrieval systems are datassettes.

Being newly formed, we have abundant ideas. Our drawback is software and hardware availability. Being one of few prison user groups, with no civilian sponsors, access to software and hardware listings and current prices is scarce.

We plan to create educational and recreational programs and use them to create a fund base for club expansion. Could you suggest particular items our club should attempt to procure, and areas most needing program development for CBM equipment? Your assistance is most appreciated.

Ed Reitan, President
The Computer Club
North Dakota State Penitentiary
Lock Drawer 1497
Bismarck, North Dakota 58502

Any suggestions from our users can be forwarded directly to Ed. **C**

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Power/Play Readers Speak Out

Diane LeBold

In April we mailed a reader survey to 1000 *Power/Play* readers, chosen at random from our subscription list. Much to even our astonishment almost 50% answered the questions and returned the survey to us.

Some of the most interesting responses were in the section of the survey titled "Other Comments". We thought you'd like to see a selection of your fellow readers' opinions and suggestions for both the magazine and Commodore in general, as they appeared in this part of the survey. Following the reader comments you'll find our responses to certain issues we think should be addressed.

Give Us Harder Material in Power/Play

"More in-depth technical information... advanced tricks and techniques in machine language... articles on interfacing Commodores to other devices."

"I would like to see an article on chess programs: how they work, their algorithms, etc. Also... articles on machine language."

"I would like to see more articles on machine language..."

Give Us Easier Material in Power/Play

"I think one needs a more basic background in computer programming... than I have to benefit from your magazine."

"Would like to see more for the absolute beginner."

"The magazine is too far advanced for our use."

Give Us More Practical Applications

"The magazine was a waste for me. Too much Kids' Corner, not enough help for me with the operating system's practical applications..."

"More info on database manager programs..."

"The magazine deals too much with games..."

Give Us More Games

"I would like to see more game programs..."

"I feel you need more about games..."

Our Suggestions for Improving the Magazine

"I would like to see more programs for the Commodore 64."

"I'd like to read an article about proper storing of data on cassette drives..."

"My only suggestion to improve your magazine would be to give more programs."

"Make sure your articles are not too biased."

"It is most discouraging to (children) when they spend hours copying and debugging a program and find that it will not run. Magazines should have a toll-free hotline to help..."

"I suggest that you run and save all programs you type in and then when you publish them, list them on your printer. Then you'll have a program which is absolutely sure to work."

"Proofread the programs for spelling."

"The games listed... should have a little more information on how to type them up..."

"I would like to know the best place to purchase software and computer accessories..."

"I wish more information were available on the actual use of software. I find that I buy it only to find out it is not what I anticipated."

How We Think Commodore As a Company Could Improve

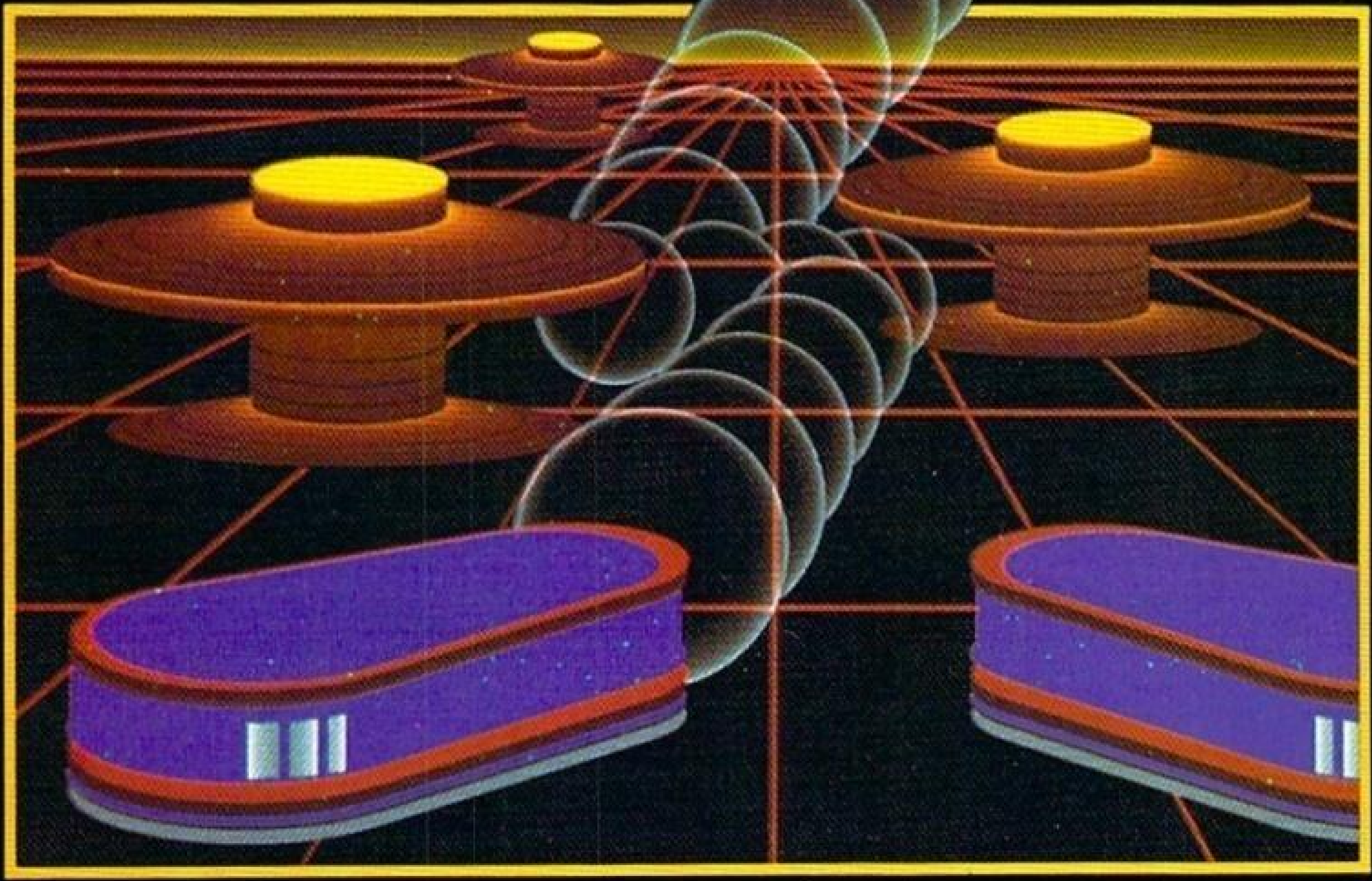
"I would like to see more educational programs on cartridge."

"(A) situation I have encountered is lack of inventory at the dealer level, e.g., printers without paper, disk drives without disks. This has been very frustrating."

"The Super Expander is very useful but its graph-

TAKE A BREAK!

For Commodore 64



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ics are almost useless without a plot chart..."

"I am really unhappy that the cartridges for the VIC 20 won't work on the C64."

"I would like more software for the VIC 20 for business applications..."

"Most of your cartridge software needs to be repackaged... Most of it simply informs the buyer of all the peripheral equipment he can buy. It ought to tell you about the game."

We Like You, Commodore

"The whole family uses the computer. We are loyal Commodore users and will continue to be so.... Keep up the good work."

"I owned a VIC 20 before the C64 and am very happy with the Commodore products."

Our Response

We certainly appreciated hearing from all of you. Whether you love us as we are or think we need to improve, your comments are always helpful and we hope you will continue to write to us, reader survey or no reader survey. However, we'd like to answer a few specific questions you raised in the survey.

First, we do try to balance advanced and beginner material, Commodore 64 and VIC 20 information, program listings and product-oriented articles. Sometimes one issue may be more heavily weighted one way or the other, but over the course of a year, it comes up pretty even. If for any reason, however, you feel you've subscribed to the wrong magazine and would rather be getting our sister publication, *Commodore Microcomputers,* instead (or vice versa), just let us know and we'll be glad to transfer your subscription. In fact, those of you who expressed an interest in getting "more practical information", might be happier with *CM.*

We also think you should know that we always, always, always print our program listings on a letter quality printer right off a working disk that has been tested and debugged. We do not touch them after that, except to paste them directly onto the page that will go to our printing house in Minnesota. If it turns out that there is a quirk in a program and we missed it, we publish a correction immediately in our "Glitch Fix" column—which, you might notice, hasn't been very large lately.

I know there are many of you who are probably sitting there saying, "Oh sure, that's easy for you to say, but what about that program I spent six hours typing in and three hours proofreading, and *still* kept getting ILLEGAL QUANTITY errors?" Don't despair! Remember, first, that programming is a skill that takes time to master. You wouldn't expect to sit down and play even a simple song without ever having had a piano lesson, would you? (Unless you're one of those natural talents, that is.)

Okay, then, if you're having problems with your programs the logical thing to do is to find a more experienced programmer to give you some lessons —right? Absolutely, but where? Hey—how about your local user group? Or your local bookstore, where you'll find a large selection of books about programming Commodore computers, many of them written for stonecold beginners? Better yet, try both.

The point is, if you've typed in a program from our magazines and it doesn't work, before you spend your twenty cents sending us a complaint letter, try a few alternatives. You'll learn a lot more than if you just throw up your hands in disgust.

In this issue we've focused on user groups to help you understand just what a valuable resource they are for you in all phases of computing. So, if you turn to our features section—and then to our user group list—you'll be on your way to getting more personalized help and pertinent information than any magazine can give you. So do it! **C**

—Diane LeBold
Editor

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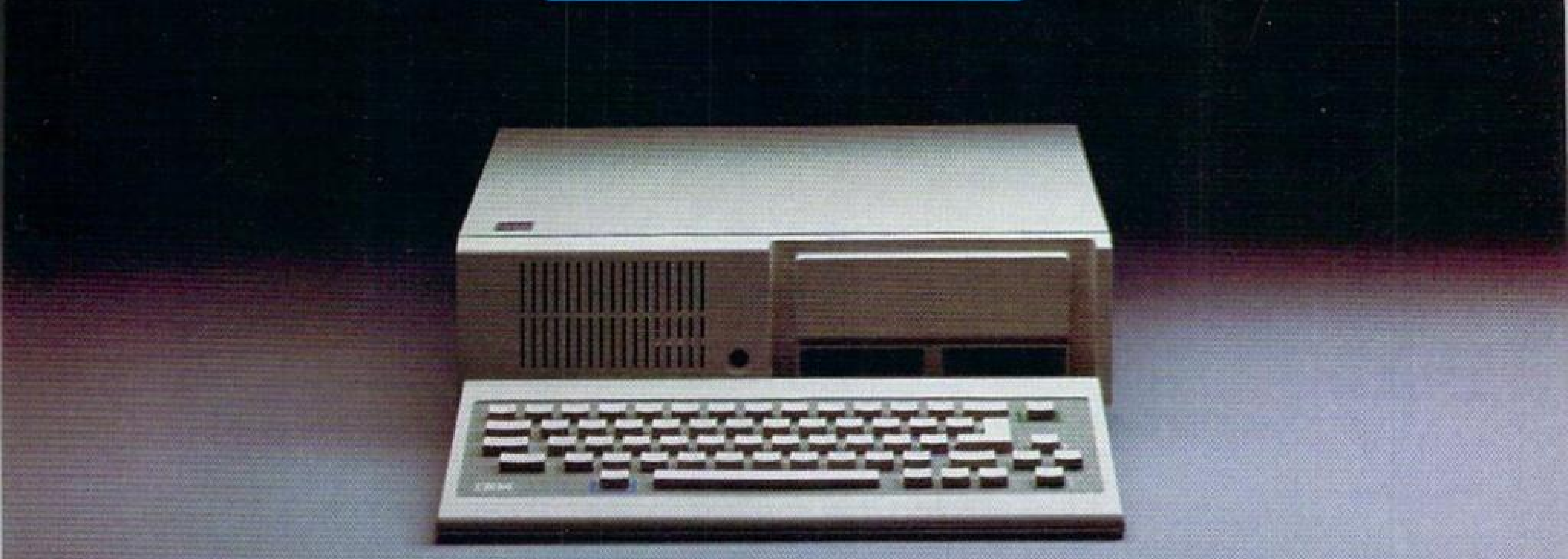

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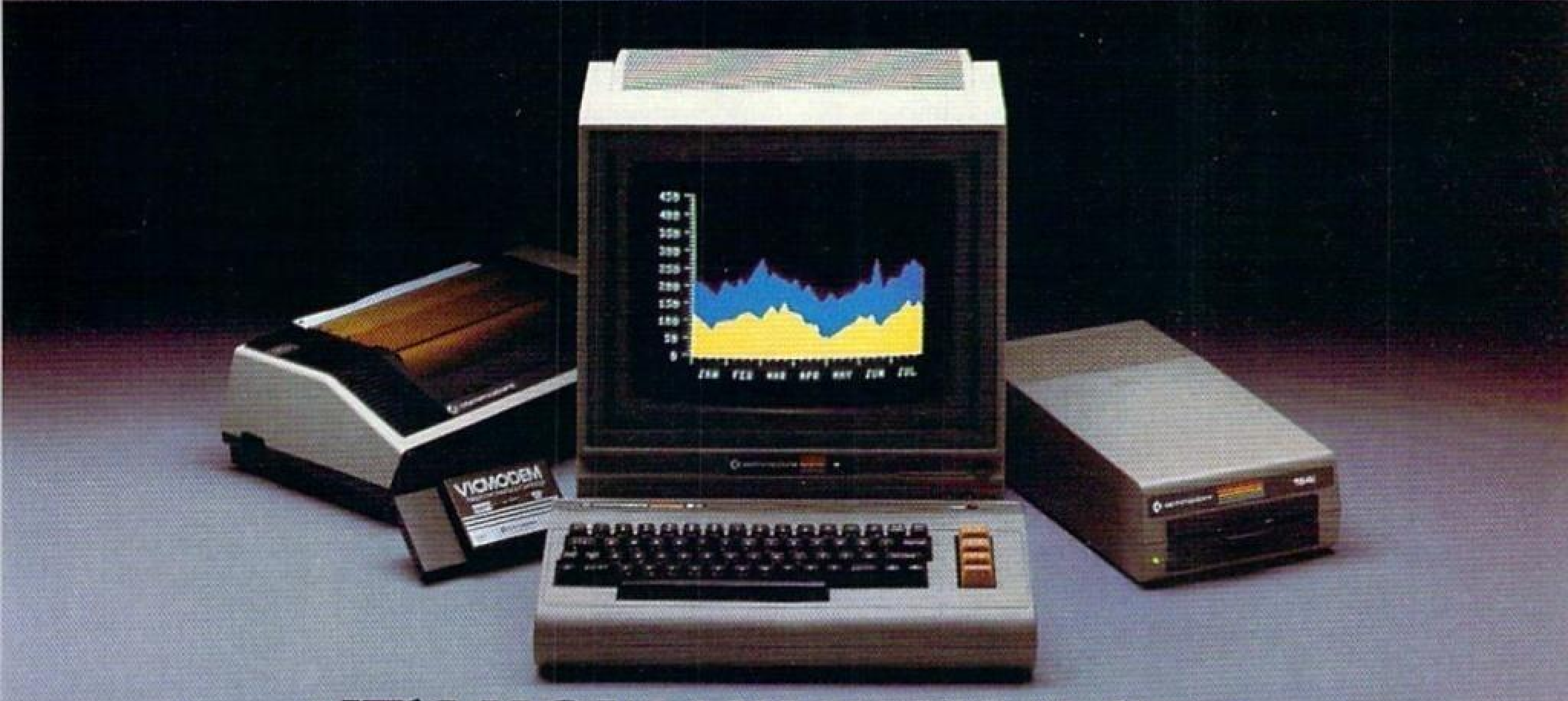

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COMMODORE 64

IT'S NOT HOW LITTLE IT COSTS,
IT'S HOW MUCH YOU GET.

Kid Grid

Reviewed by Peter Deal

Computer: Commodore 64
Publisher: Tronix
8295 South
La Cienega Blvd.
Inglewood, CA 90301
Medium: Disk

Do you live in a world of bullies? If you do, *Kid Grid* is your kind of game. You are "The Kid" (most appropriate in my case) and your job is to connect dots on a grid. Easy, right? Not really. You also have to avoid the bullies: Squashface, Thuggy, Muggy and Moose. You know how the saying goes, "No two bullies are alike". (Don't worry if you didn't know it, because I just made it up.) These are unusual bullies. Each one has his (its?) own shape.

Anyway, you have been pitted against these mean bullies and now the worst part... they're faster than you are! But then again, you have Stuns. Stuns will "freeze" or "stun" the bullies, making them motionless and, of course, harmless. But there are two problems. The stuns don't last too long and you don't get many (well, there has to be a challenge!).

Back to the idea of having to connect dots on a grid. As you connect the dots, a path of connected dots follows behind you and if you connect a square of dots, the square will get filled in. As soon as you have filled in all the squares, you go on to the next level, which will be a little different than the last. Every level you complete you will receive extra stuns. You can choose how many you get on each level before starting the game. If you happen to fill in a square with a question mark in it, you will receive 100 to 500 points.

I was amazed at how clear the instructions are. They are very detailed, even though there are only two pages! You don't really need everything on those two pages. You only need the first page which has the loading instructions, functions of the function keys and "things to know."

Some of the best graphics features are the colors of the screen titles and the Hall of Fame. The opening title, which says "Kid Grid," flashes each letter in a different color. The Hall of Fame flashes each line in a different color, creating an effect of the colors moving upwards. The animation of the bullies and "The Kid" is spectacular. The graphics are certainly outstanding.

Kid Grid only has one tune that I know of and I call this the "Tune of Stars" because it only plays after "The Kid" gets beaten up (and so "The Kid" sees stars). Most certainly the best sound effect in *Kid Grid* is the "whistle" that is played after completing each level. I'm not sure if it is a whistle, a siren or a very angry bird.

As far as the action goes, anyone who doesn't go crazy trying to avoid those stupid monsters in that Japanese game where you eat dots certainly will be entertained. There is definitely a smoothness to the action. *Kid Grid* has a special ease of control that many games don't.

Since I have played *Kid Grid* so often, I have developed several point-getting and level-passing strategies. On all levels, especially the first level, go in a zig-zag pattern (i.e., right, down, left, down, right, down, and up, left, up, right, up, left and so on). Anticipate the bully's next move. A little experience will be needed for this.

Now we come back to the issue of Stuns. If you choose seven Stuns per level, it is alright to use them to pass through bullies instead of going around them. The bullies don't really know where you are. They just seem like they do. The bullies are so stupid it's not funny, even though it is.

Kid Grid has some special features such as a pause and a Hall of Fame. One of the many nice things about *Kid Grid* is the short loading time—40 seconds.

Kid Grid stays fun for a very long time. Even to a very advanced player or to a real pro, *Kid Grid* continues to entertain.

I recommend this game to anyone who likes that popular dot-eating game or to anyone who doesn't often play shoot 'em type games.

Circle Reader Service No. 500

Moon Shuttle

Reviewed by Peter Deal

Computer: Commodore 64
Authors: John Butrovich and
Toni Hernandez
Publisher: Datasoft, Inc.
9421 Winnetka Avenue
Chatsworth, CA
Medium: Disk and tape
(one package)

Moon Shuttle is a great game, but when I first played it I wasn't too impressed. It seemed as though the best part of the game was the screen title, which was very well done. The screen shows a planet with the words "Moon Shuttle" written across it and a shuttle flying around it.

The first part of the game is an asteroid field. You must shoot a path through the various sized asteroids. If you get killed in an asteroid field, the computer insults you (or at least me) by saying, "NEVER GIVE UP!" which puts me in a bad mood. If you do survive, you get a bonus, but if the bonus is 500 (the maximum bonus of some levels) the computer will say, "SO. SO." You will then face another enemy and then back to an asteroid field. This time parts of the field will move and the cycle will repeat.

The sounds in *Moon Shuttle* are almost all explosions, making things sound like a western gunfight. Aside from that, the other sounds are very original.

The graphics are tremendous, especially the explosions, because it looks as if whatever got hit is disintegrating. The asteroids are one of the best effects because each one is a different size and when they blow up, the bigger the asteroid, the bigger the explosion. The aliens in this game are unusual but often very hard to hit because they are straight up and down. All movement in the game is very smooth and consistent, especially the movement of your shuttle.

There is certainly a large element of challenge, but sometimes too much. I often cannot get past the Man-O'-Wars, which although it seems very easy at first, is pretty difficult. But, believe it or not, my favorite part of the game is the Man-O'-Wars, because they look like big blue and purple monsters bouncing on tricycles.

Someone who is an overall game freak will probably love *Moon Shuttle*, but an advanced game player and programmer might not find it too entertaining. This game is very similar to *Galaxian*, *Galaga*, and even *Space Invaders*.

The instructions for the game aren't too clear, especially if you want a two-player game, because you aren't told that you need two joysticks. For a one-player game put the joystick in port one.

I have found that shooting as many asteroids as possible will soon get you a bonus ship—but only if you somehow reach 20,000 points. When you reach the Man-O'-Wars, sweep left and right, and shoot nonstop. But most important *don't take any unnecessary risks*. If you do, you might end up losing a shuttle.

Moon Shuttle is fun to play, and remains a challenge even after hours, but, as with many games, you can get bored with it eventually.

Peter Deal is a Commodore enthusiast who lives in Malvern, Pennsylvania.

Circle Reader Service No. 501

Julius Erving and Larry Bird Go One-on-One

Reviewed by Steve Finkel

Commodore Software

Computer: Commodore 64
Publisher: Electronic Arts
San Mateo, CA
Medium: Disk

You don't have to be tall and powerful to shatter a backboard with a slam dunk. You don't have to be exceptionally graceful to make a 360-degree turnaround, fall-away hesitation jumper. What you do need is Electronic Arts' *One-on-One* basketball game for the 64. *One-on-One* features the two top forwards in basketball, Julius (Dr. J) Erving and Larry Bird. Erving is renowned for his leaping ability and his phenomenal dunks, while Bird is noted for his automatic jumper, strong rebounding and tough inside game. This game pits Erving against Bird in a one-on-one showdown, and Erving and Bird play remarkably like the real-life players might play in a one-on-one game. Both players can shoot jumpers (even three-pointers), dunk, make spring moves, box out, block shots, steal the ball and break backboards.

Erving and Bird were in fact involved in the development of this game, and the representations emulate the play styles and strengths of both players. Dr. J is quicker, more adept at spin moves, able to leap higher and more likely to throw down an inspired dunk. Larry Bird can toss in jumpers seemingly with his eyes closed, is a stronger rebounder, a better long-range shooter and tougher on defense. Although neither player's computer likeness would be considered flattering or precise, the important element is that they play like the men they represent. And on that criteria, this game definitely deserves to play before a sellout crowd.

One-on-One features several game options, including four levels of play, your choice of player (Erving or Bird) when you play against the computer and the option for a two-player game. You can select a timed NBA-length contest or play up to a certain point total.

There are many nice touches that add to the overall quality of this game. After a move to the hoop or a follow up tap, you could get an instant replay, which is a slowed down recreation of the previous play. These are especially good for gloating at your opponent's expense. Another element implemented in the game is fatigue. The more you have your player run and jump, the higher his fatigue level becomes. The lower a player's fatigue level, the better he shoots. A player can regain his wind by slowing down or by calling a timeout. There is even a referee who will occasionally outrage you with what seems like an atrocious call. But he stays out of the way most of the time, and his bad (and good) calls usually even out. As any NBA coach would tell you, a ref can be inept as long as his calls go both ways.

Finally, there is one more thing to recommend this game. For a hard-core basketball addict, there is no sound as satisfying as the "swish" that the ball makes as it slides through the net. A finger-roll or a perfect jumper, when the ball drops through the net without making contact with the rim, is incomplete without the soft whisper of the swish. The sound effect for this in *One-on-One* is as gratifying and realistic as the real thing. For a hoops aficionado, the swish sound alone is worth the price of admission. All in all, *One-on-One* basketball is the next best thing to watching the real Erving and Bird go one-on-one.

Circle Reader Service No. 502

Repton

Reviewed by Tony Caramanico

Commodore Telecommunications

Computer: Commodore 64
Authors: Dan Thompson and
Andy Kalzniacki
Publisher: Sirius Software, Inc.
10364 Rockingham Drive
Sacramento, CA 95827
Medium: Disk

Nuke bombs, Nova Cruisers, energy beams and a Power Tube are just a few of the many spectacular features of *Repton* by Sirius Software. If you are one who enjoys the fast action, narrow escapes and the highspeed thrill of a challenging space-type arcade game, you will love *Repton*.

The three outstanding features of the game that make it one of the top games for the Commodore 64 are its great animated objects, its special keyboard functions and its overall theme.

You control a *Repton* Armageddon ship equipped with nuke bombs and an unlimited supply of lasers. It also contains an energy converter for the Draynes and a shield that is activated when you are not firing lasers or thrusting forward. You receive another *Repton* Armageddon ship for every 5,000 points that you earn.

The main goal of the game is to prevent the Quarriors from completing the Energy Center and the Draynes from stocking it with energy. The energy obtained by the Draynes can be recovered by flying through an energy beam while the draining is taking place. This replaces either the energy stolen or your nuke bombs if they are low. You must then fly through the Power Tube to recover the stolen energy.

If the energy center is completed, which is inevitable, or the energy grid is drained, the Armageddon bomb will be engaged and you will be taken underground to encounter the enemy. There your surface scanner is obsolete and you must strike the Main Generator to defeat the enemy.

In addition to the regular features, *Repton* offers a pause feature which is excellent for when you are interrupted when you are just about to destroy the underground Energy Generator or you've just destroyed the first five rounds and want a break.

Repton is one of those games that does not get boring after you've played it 50 times because it becomes increasingly difficult as you improve. I strongly recommend it for the more advanced player, but instructions are adequate for any player.

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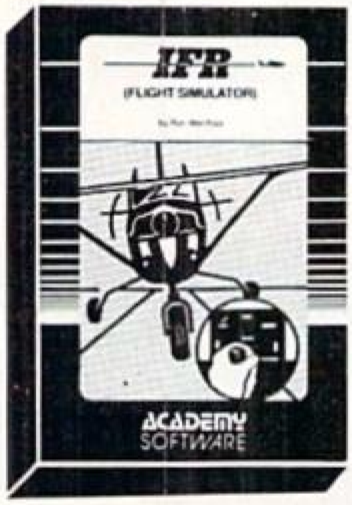

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Circle Reader Service No. 7

A few hints: after you have destroyed the first wave, the Draynes will start to drain more energy. Try and eliminate these first. Also try to destroy the Nova Cruisers with the nuke bomb to get rid of the smaller ships. And last but not least, make use of the pause feature to give yourself a break as you advance to the upper levels.

Circle Reader Service No. 503

Drol

Reviewed by Tim Onosko

Computer: Commodore 64
Author: Aik Beng
Publisher: Broderbund Software
17 Paul Drive
San Rafael, CA 94903
Medium: Disk

Whether the pictures created on a Commodore 64—or any other personal computer—are "art" or not is a moot point at best. Except for images of near photographic quality produced on powerful and expensive systems, most computer pictures look something like out of focus snapshots squeezed through a screen door.

Consequently, the best microcomputer visuals are the ones that aim, not for reality, but *style*. Aik Beng, the pseudonymous author of Broderbund's *Drol* recognizes this and has written what is perhaps the single best looking game for the Commodore 64.

Drol, befitting of its title, is a wry but disturbing arcade style game set in a child's nightmare. In it, the player guides a tiny robot through multilevel hallways—a scrolling screen in profile—searching for two lost children (a boy and girl, each preoccupied by following a toy helicopter or balloon), their jet-powered pet lizard and their mother, who is bound in ropes and hidden in a basement in the final screen configuration.

The antagonists in this search are bizarre characters: seahorses, some goonish creatures, a witch doctor, etc. Thrown in for good measure are flying battle-axes and other threatening cutlery, a few carnivorous plants and a silly, honking vacuum cleaner that shows up later in the game.

Basically, this is a shoot-em-up and might easily be dismissed as such, but the design and animation are so good, so skillfully executed, that the action and object of the game take a back seat to the visual entertainment. Beng's work shows his influences as an artist. The entire effort is reminiscent of Winsor McCay's landmark cartoon strip from the early part of the century, "Little Nemo in Slumberland." The goons mentioned above are an obvious nod to the underappreciated work of California "hot rod" cartoonist Ed "Big Daddy" Roth and the animation (limited as it may be) is in the style of the great Hollywood cartoons. This is a truly significant game; the first real interactive cartoon of the microcomputer era.

Aik Beng may be *the* game designer to watch. Indications are that he is also the designer of Sirius' *Squish 'Em,* although that previous effort was far more infantile, much less entertaining and definitely not as attractive. Let's just call this one his first and take it from there.

There are very few complaints about the program. Joystick response is swift. The action, overall, is fast and smooth. Unfortunately, however, each new level of play requires new characters and screen objects to be loaded from the program disk. This means considerable delays from level to level and is the single reason why more impatient players probably won't come back to the game as often as they could.

Nonetheless, kudos are in order for the creative Mr. Beng.

Circle Reader Service No. 504

The Commodore Computer Club— A National Organization at Last!

by Betsy Byrne

This special User Group issue of *Power/Play* is my golden opportunity to share some exciting news with you. Commodore is sponsoring a National Commodore Computer Club (bells, whistles and fanfare... ta da)! More than 10,000 people have already joined and new applications are coming in every day. At this point, membership is structured for individuals at $10.00 per person per year.

With membership, each person receives:

- A regular newsletter (more details in a minute)
- A quarterly catalog of Commodore products that can be ordered by direct mail if you have no local source.
- Access to an "NCCC members only" section of CompuServe with special online conferences.
- Advance announcements and reviews of new Commodore products.
- Special scholarship opportunities.
- Pride in belonging to the largest support net of Commodore users in the USA.

The NCCC newsletter, of which I am editor, holds a monthly user "meeting" between its pages. Presentations of products and programming techniques, question and answer sessions with Commodore expert Jim Butterfield, and group discussions in the letters column lend just the right atmosphere, making it seem like a group of friends has gathered together to talk about Commodore computers.

Topping off each "meeting" is a sprinkling of "computer culture" offered by computer artist Eddie Johnson and Commodore musician Peg Herrington. Johnson shares both his graphic programming abilities and his awe-inspiring illustrations with club members each month in a humorous column known as the "Bud Izzit Art School." Peg Herrington's love of music is nothing short of infectious, whether she is eloquently defending the music making capabilities of the powerful little VIC 20 (her first love) or excitedly describing the latest Commodore 64 musical techniques.

The NCCC belongs to the people who have joined, who read the newsletter and who send letters or articles in to me for publication. It belongs to the people who upload and download programs, pictures and text to and from our special section on CompuServe (where they are assisted by NCCC SYSOP Betty Knight). It belongs to *you*. If you feel that your computer investment is worth an extra $10, you will be able to link up with the millions of other people in North America who bought Commodore computers for education, profit, or just plain fun.

Submissions to the NCCC Newsletter or questions for Jim Butterfield should be sent directly to me. I would also like to receive copies of local club publications. Please note on each copy if you would like me to consider all or part of the contents for publication in the NCCCN. If I am able to use material, I will send your club any one item of Commodore published software of their choice or a free subscription to one of Commodore's magazines. For individual submissions, you may use the Kids' Corner "How to Submit Things" format in this issue as a guide with this addition: articles should be 1,000 words or less to be considered for publication. Or call me with ideas, comments and suggestions at 505-821-5812. My address is:

Betsy Byrne
Editor, NCCC Newsletter
6209 Leslie PL NE
Albuquerque, NM 87109

Here's how you can join the National Commodore Computer Club: complete this form and send it with a check or money order for $10 (payable to Commodore Computer Club) to:

NATIONAL COMMODORE COMPUTER CLUB
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West Chester, PA 19380

Or if you would rather bill your VISA or MasterCard you can call toll free: (800) 323-1717.

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Keep Track of Car Costs With C*A*R*S

Do you really realize how much your car costs you? Do you know when your car needs a tune-up? Between gasoline, car insurance, payments, taxes and license fees as well as repairs and maintenance, the cost of car ownership can be one of your biggest expenses. Plus, it's not always easy to keep track of the real costs involved.

New Leaf Inc.'s Car Analysis Reporting System (C*A*R*S) was designed to determine the efficiency and cost of ownership of your vehicles. While most other programs of this nature lump all the items together, C*A*R*S keeps track of ownership and operating costs separately as well as together, to give you a more accurate picture. You can now graph and monitor all of the costs involved and even make printed reports on your printer.

By using C*A*R*S, you can graphically see if your mileage is changing and if repairs or tune-ups are necessary. You also can see how effective any adjustments have been. In addition to the numerical data, the program's colorful bar graphs will let you see trouble spots at a glance.

The indepth manual is designed to show you the most effective manner to control and manage the costs of your vehicles, and has easy to understand instructions on how to run the program. It is also an excellent tool for small businesses that need to monitor the costs of their fleet of vehicles. Using this program, you can keep track of an unlimited number of cars and/or trucks.

Circle Reader Service No. 513

Infocom Hint Books: An Open Letter

Dear Mr., Mrs., Miss, Ms., Master, or Mr. and Mrs. Adventurer,

Have you ever stopped to think what might befall your loved ones (if any) in the event that you became hopelessly lost in the wiles of an Infocom game?

Could any amount of money possibly make up for such a loss? And even if your insurance policy did provide for such compensation, do you think for one second that your beneficiaries could collect from the Bilk & Wheedle Fiduciary Insurance Corporation of Upper Mongolia? Fat chance.

No, the type of insurance you need is the kind that will prevent Infocom-related calamities from happening in the first place. And that's precisely why Bilk & Wheedle Insurance, in cooperation with Infocom, is now making available the Complete Deluxe Edition of the *Official Infocom Hint Books*.

Sure, there's a solution to every Infocom puzzle and a way out of every Infocom maze. But there are those times when even the most brilliant and daring adventurer gets stumped. That's where *Infocom Hint Books* come into play. In them, you'll find everything you need to crack the toughest cases Infocom games can throw at you. But these aren't crib sheets—far from it! The hints are amusingly and cunningly written to subtly help you arrive at the solution, instead of solving the problems for you.

There's a handsomely illustrated and easy-to-read hint book for each Infocom game and scores of clues to choose from in every book. What's more, each book features a cleverly drawn map (except *Suspended*, the map for which is already included in the game package) to help you with locations in the game, plus the amazing InvisiClues invisible ink process that reveals only the hints you need, when you need them. Best of all, the complete hint books are yours for just $7.95 each, including shipping and handling.

So even though you'll get the most satisfaction out of your Infocom game if you solve puzzles without outside help, you can feel confident knowing you've got your hint book at your side in case of emergencies—or just for downright reading enjoyment after you've finished playing.

Why not take an insurance measure that could prove a lifesaver today? To start enjoying the newfound happiness and security that will be yours through *Infocom Hint Books*, just place your order today.

With warmest personal regards, and with sincerity gushing from every pore, I remain,

Your friendly B & Wheedle agent,
Chase D. Bonewagon
VP/Fair Weather Friendly
Letters Department

Circle Reader Service No. 505

Computer Truant Officers Catch Kids in Chicago

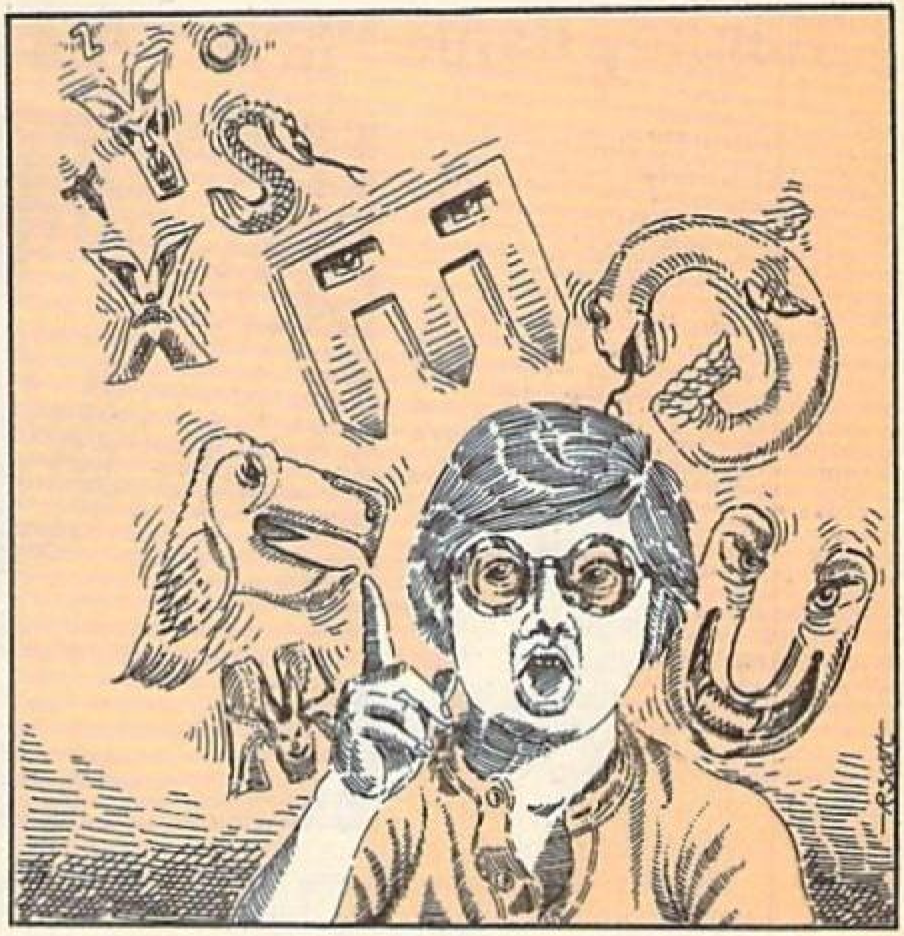
Students at 25 public schools in Chicago have a modern version of the old "troonies" to contend with if they want to play hookey from school.

Computer-controlled "robot telephones" are being programmed to call the pupil's home with a recorded message from the school's principal, reporting the pupil's unexplained absence and asking parents to call the school.

And if there is no answer during the day, the robot phone will keep calling the home, all by itself, until 10 P.M. Some of the messages are even bilingual (English and Spanish), just to make sure that the parents know what's going on.

The truant-officer phones were adapted from devices that will automatically dial sequential numbers all day long and half the night with advertising messages for potential customers.

Arcade-Style Typing Tutor



Developed by a game designer and a professional educator, *Type Attack*, the top selling game from Sirius Software, teaches typing skills in a fast action arcade-style game. Groups of words and letters falling from the top of the playing field must be stopped by typing the same words or letters on the computer keyboard.

Type Attack includes 39 preprogrammed lessons designed to follow standard typing course format in such a way that the player automatically learns typing conventions and concepts while playing the game. Also featured is a Lesson Creator, with which the player can design lessons to help with specific typing or vocabulary problems, and a real-time words-per-minute bar with settings from 1 to 99.

Suggested retail price is $39.95.

Circle Reader Service No. 506

Computer Composition Teacher Helps Kids Improve Papers

Writers can buy simple dictionary-style programs for their home computers to help clean up their prose, but a professor at Hobart and William Smith Colleges in Geneva, New York, has adapted the idea to help college students improve their writing.

By using a number of specially tailored programs, says John E. Thiesmeyer, associate professor of English, students in his expository composition class learn how to tighten and polish their writing—using the computer for clues, not answers.

"It's important to emphasize that in the entire process, the students are offered no corrections of words or phrases," he says. "The computer offers an incentive, but the work is still in their hands."

With the aid of several commercial programs—a spelling checker, a concordance to keep track of excessive repetitions and a phrase checker to seek redundant or awkward passages—Thiesmeyer says students are preparing better papers.

"The computer is a learning aid quite different from teachers handing papers back with post-facto analyses," he explains. "The machine can intervene constructively in the writing process, to provoke considerable revision before the work is turned in."

The result? "The students are handing in the best-looking papers they've ever prepared. They're getting better help than I could give them by circling misspellings and mechanical errors with red ink."

Students first write a rough draft, then type it into the word processor system. Next, a spelling checker with a 75,000 word vocabulary proofreads the document. The machine "flags" spelling and typographical errors but won't correct them for the writer.

"Some dictionary programs offer automated correction, but as an educator, I hate that," Thiesmeyer says. "Our version keeps the student involved in

Once all these possibilities have been considered—two drafts later—the student prints a hard copy, handing in a revised and edited paper that fixing the mistakes."

He notes that the particular software he uses has a large dictionary because groups of students appear to have a collective vocabulary closer to 100,000 words than to the 15,000 word range of the average person. The program also numbers each sentence to help pinpoint errors more readily.

The composition is next reviewed by a concordance or word frequency list, to see how often certain words appear. Again, it's a readily available program, designed for everyday word processing functions.

Finally a usage checker is used. Thiesmeyer's phrase dictionary first held a 500 word store of trite, wordy, vague, awkward or redundant passages, but he has since expanded the program to watch for over 2,100 such misuses.

the professor can check for writing quality and content rather than primarily for errors.

Will the process become a crutch for student writers? Thiesmeyer says no, because students can't memorize each individual mistake.

"Eventually students begin to internalize and remember the categories of error," he explains. "They start to recognize wordiness, redundancy and other problems in their work before they type it into the computer."

He would like to do a study which would compare a number of computer-scrutinized papers with an equal number written without the machine's programs.

The study, he says, would give substantive indications of the effectiveness of writing by computer. "Everything so far has been all anecdotal. Nobody has any hard information on whether the process makes people better writers in the long run."

Monkey Game Players Aid Nutrition Research

Manipulating the joystick, Albert guides a gobbling Pacman figure across the video screen, past a banana-shaped figure to a red rectangle. As the figure devours the rectangle, yellow lights flash and a miniature marshmallow rolls down a chute to Albert's left. He pops the marshmallow into his mouth and, still chewing, returns his attention to the screen.

Albert, a 10 year-old rhesus monkey, spends about four hours a week playing video games at the University of Montana. He is helping Steve Lavender, a 24 year-old graduate student in psychology at the university, find a good way to measure the effects of poor nutrition on learning.

Working with University of Montana psychology department chairman David Strobel, Lavender's first goal is to teach eight rhesus monkeys how to play the video games which he and Strobel design.

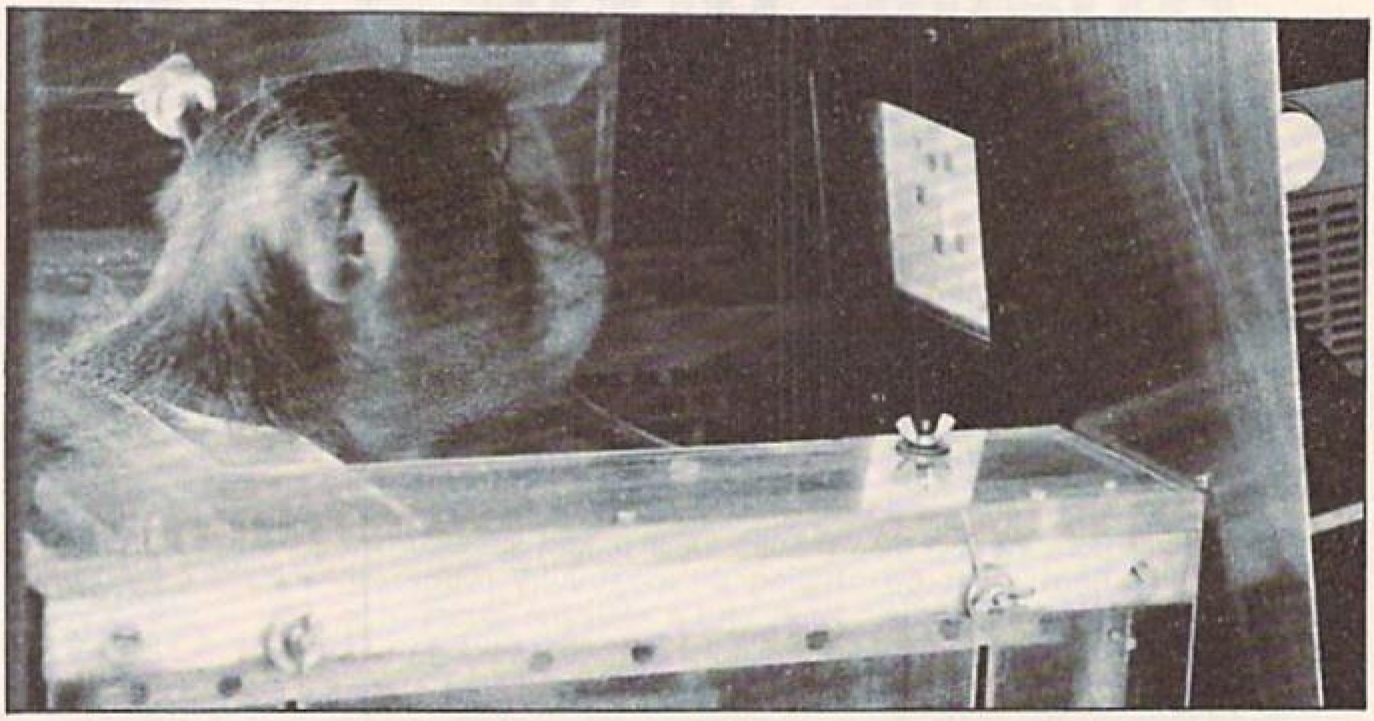
Later the researchers want to use the monkeys' game performances to judge how diets deficient in zinc, copper and protein affect behavior. Lavender said other studies have suggested that animals with zinc-deficient diets fail to learn from their errors.

The researchers speculate that the games could also be used to test foraging behavior in animals, including humans. They hope to design a computer program in which the monkeys could forage with the Pacman figure for either high- or low-nutrition foods to see which they prefer.

The study is funded in part by a grant from the U.S. Department of Agriculture. Lavender is optimistic about the versatility of video games for use in experiments because they enable researchers to run several different tests without changing the apparatus and also allows self-paced testing. The University of Montana is one of the first to participate in these testing techniques.

Albert and the other monkeys play in a phone booth size apparatus equipped with a video screen and a horizontal joystick. They sit in a clear plastic chair which positions their heads in front of the screen. While other researchers often anesthetize monkeys to put them in the chairs, Strobel and Lavender have taught their monkeys to climb into the chairs for food rewards.

To avoid distracting the monkeys, the researchers pipe folk-rock music into the playing booths to cut down on noise interference from outside. They also observe the monkeys playing on one monitor and the game action on another.



Rhesus monkeys play video games for marshmallow rewards to help researchers at the University of Montana study the effects of poor nutrition on learning.

Since beginning the experiment, Lavender is playing more video games himself. He often finds himself rooting for the monkeys as he observes.

"It's like watching your home team play," he said.

Sourcebook for Software Writers

Running Press announces the availability of *The Software Writer's Marketplace*, a book which is not only a where-to directory of aggressive software buyers, but an invaluable tool offering step-by-step guidance for the millions of computer owners who want to make money in this burgeoning industry.

Over 500 companies soliciting software from the general public have supplied the vital information found in this book. The authors, themselves successful software writers, have compiled this information and have included step-by-step instructions on researching the market, structuring salable programs, writing acceptable documentation and more.

Once the program is written, the book takes the writer through the labyrinthine task of selling to the industry—from the initial query letter to the signing of the contract. This essential sourcebook for the software writer even offers a section of invaluable copyright information written by a specialist.

Circle Reader Service No. 509

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Circle Reader Service No. 19

Mystery Books Teach Programming

The husband and wife team of Floyd and Lois McCoy have been involved with computers and children for over 20 years. For the past year, Lois and Floyd have been at work on *The Bytes Brothers*, a series of six mystery books.

Each book contains five stories plus five paralleling computer programs written in Bytes Brothers BASIC—a "language" utilizing BASIC commands that run on all microcomputers. The series, with its generic BASIC, was hailed by the editor of the Children's Television Workshop's *Enter* magazine as "the best children's computer literature I've seen, by far." The series includes six books of whodunits with programs. The reader follows along as the intrepid Bytes Brothers and their computer-literate neighbor, Elana Lynsky, solve mysteries in their hometown of Lamont Landing with the help of Nibble, their trusty computer.

The first two books were published in the U.S. by Bantam last spring and the following four books will be out in the fall. Already, the books are selling extremely well in the U.K., including Australia and New Zealand. Four book clubs are distributing *The Bytes Brothers* in addition to retail sales outlets.

Circle Reader Service No. 510

Learn Programming on Video Tape

Problem Solving in BASIC consists of two 30 minute videocassettes that teach viewers how to program the Commodore 64 in BASIC. Directed by Belove-Laiserin and produced by the Hayden Book Company of Hasbrouck Heights, New Jersey, the two videotapes represent a new product direction for Hayden.

"We believe there are a great deal of people buying computers and video players. As our books and book/software packages fill the needs of computer owners, our videocassettes will fill the same needs for video player owners. Since our videocassettes are educational, they also broaden the scope in which video players are used in the home, school and industry," said David Edwards, vice president and general manager.

The tapes introduce top-down programming as a primary problem solving technique. Viewers learn how to state a programming problem into modules or subroutines, then write the BASIC instructions for each step or function. Finally, the programmer links all the parts together and refines the final program.

Available in a VHS or BETA format, both packages include a programming guide, cover applications for home, business, school, recreation and are written for novice or intermediate programmers.

New Home Accounting Package

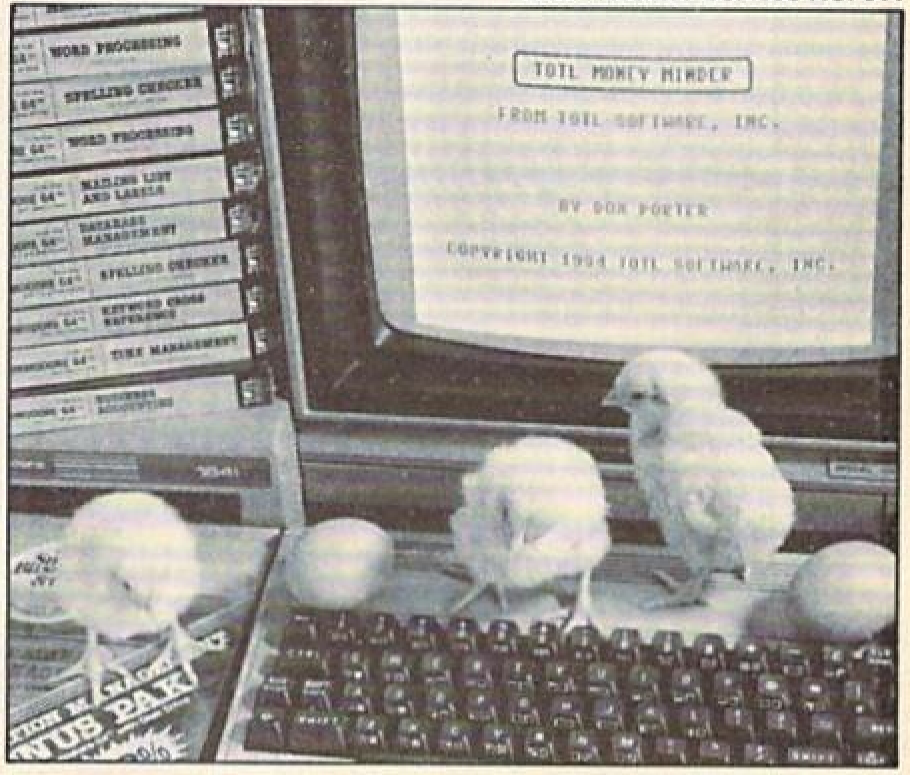
TOTL Software Inc., manufacturers of practical small business and home productivity software for the Commodore 64, have announced the release of their eighth software product. TOTL.MONEYMINDER is a complete home accounting system designed to complement other software already available from TOTL. It was shipped to distributors and dealers in early 1984 and carries a suggested retail price of $39.95, consistent with the other low-cost programs available from TOTL.

TOTL.MONEYMINDER is a disk-oriented set of programs, compatible with most column expansion hardware, with advanced features to simplify use and increase flexibility, such as configuration file for one-time setup for screen colors, column width and any printer-interface combination. TOTL.MONEYMINDER will allow up to 110 user-defined accounts (for expenses, checking, income, charge accounts, etc.), with double-entry transactions that can be spread across multiple expense accounts. TOTL.MONEYMINDER provides a monthly reminder of all bills due and a powerful monthly budgeting capability. The system will record up to 8400 transactions per year and includes capabilities to report net worth and both printed and graphic display of actual versus budgeted expenses, with reports of the status of each account.

Other important features include a builtin database for longterm asset and liability records, with investment return and amortization tools. Full checkbook balancing and statements are provided for and a label file is easily generated to allow printing of address labels with TOTL.LABEL and interaction with TOTL.TEXT and TOTL.INFOMASTER for even more versatility.

At year's end a report is generated which shows all income and expenses, groups expenses into deductible and non-deductible, and groups deductible expenses into their deduction categories.

Circle Reader Service No. 511



TOTL Software now offers a home accounting system, TOTL.MONEYMINDER.

MicronEye Digital Imaging System

For Use With the Commodore 64

Reviewed by Ted Salamone

Manufacturer: Micron Technology, Inc.
2805 E. Columbia Road
Boise, ID 83706

Ever see those outrageous t-shirts with a computer-generated picture of the owner's face on them? Perhaps you even own one.

If you do, then you probably know something about how they're made. If not, then here's the secret. A picture, usually of the buyer's best side, is taken. Then it's digitalized through a microprocessor. This translates the normal photographic images into a binary code the computer can store and reproduce upon demand. The coded image is then transferred to the article of clothing mechanically.

Of course any item can be photographed and digitalized in this manner, though most of the equipment capable of doing this is too expensive for personal ownership.

Notice I said most. Thanks to the groundbreaking endeavors of Micron Technology, a low-cost digital imaging system is available for several microcomputers, including the Commodore 64.

Known as the MicronEye, this multipiece electro-optical imaging system is available in two versions.

A compact unit known as the MicronEye Bullet has a builtin tripod, a removable lens, the necessary cable and diskware and an electronics board which plugs into the 64's cartridge slot.

The MicronEye Camera is a larger unit which builds on the Bullet. Its main advantages include a serial card capable of interfacing with other microcomputers and the ability to be used from a more remote position. The Camera model can be used up to 50 feet away from the computer as opposed to the Bullet's apronstring five.

The soul of both units is the OpticRAM, a device composed of 65,536 image-sensing pixels organized into two arrays of 128 by 256 pixels each. It is this device which creates the digital picture that is transmitted to the computer and monitor.

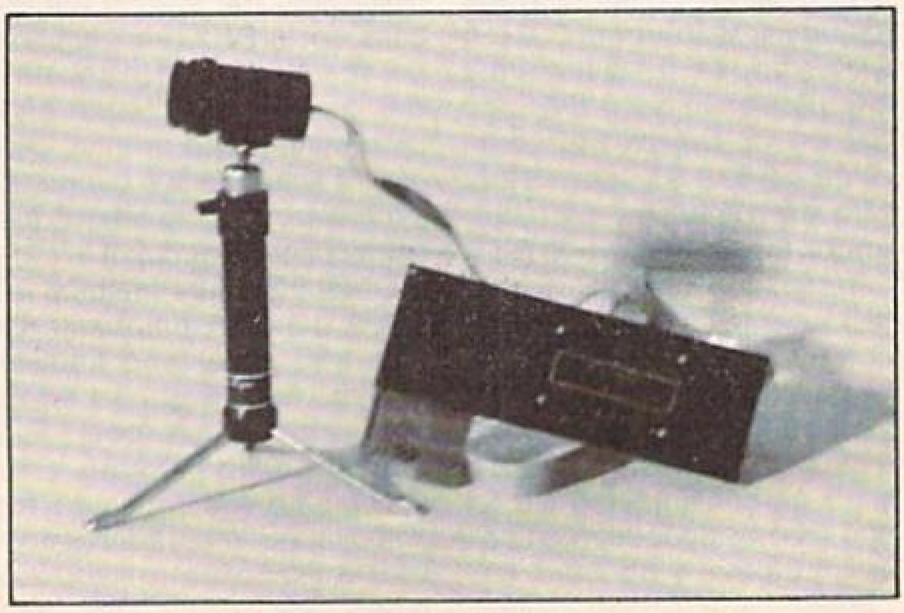
Due to its digital nature, the MicronEye reproduces items mainly in black and white, though gray shading can be produced through multiple scans of the subject at different exposure times.

Don't start despairing that this is for technical nerds only, because it's definitely not. A novice can unpack, hook up, and start using the Bullet in under 30 minutes.

Dissecting the Bullet

The Bullet model (subject of this article) was given a thorough test over a two-month period. The entire package consists of the Bullet, a close-up ring, a diskette and a pretty comprehensive manual. The Bullet itself is composed of a casing, a 16-wire ribbon cable, the installed OpticRAM, an interface board and a 16 millimeter TV lens with electronically or manually adjustable F-stops.

It is a rugged, well designed device with a sleek black and silver metal case. Light, compact and capable of accepting various lenses, the Bullet is well conceived and executed.



The MicronEye Bullet lets you "take pictures" on your Commodore 64's screen.

how to rea get in touch with your computer.

Edumate Light Pen

The Edumate™ Light Pen puts you closer in touch with your computer than ever before. Paint a masterpiece, or play an interactive game simply by moving the pen across the screen. Compared to other graphic peripherals, the Edumate stands alone. Drawing is now easy. Because it's natural. Just connect the Edumate and touch the screen. It's as simple as that. No awkward touchpad surface. No unnatural joystick controls. And look what else is at hand. You can choose from a complete line of educational and entertainment software. Our Playground Software™ series brings the magic of the Edumate together with the amazing computer voice of S.A.M.,™ the Software Automatic Mouth, so children can interact directly with our teaching programs. Our new advanced graphics program, Peripheral Vision™, allows you to draw or fill in 16 different colors, a variety of sizes and textures, and zoom in for greater detail. You can save your picture to disk, print a copy for your friends, and more. What could be more natural than picking up an Edumate and letting your imagination run free!

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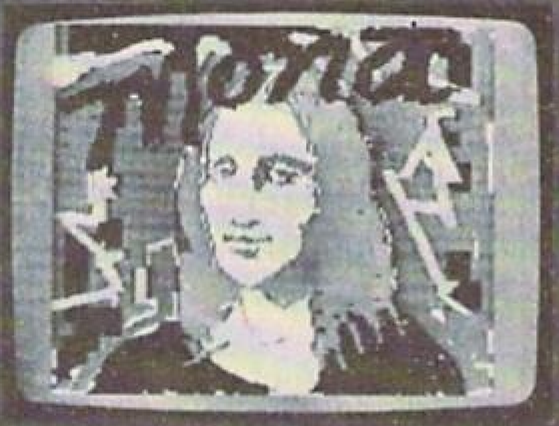

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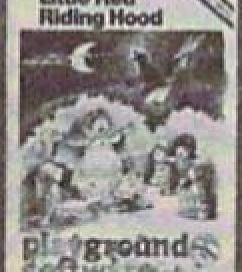
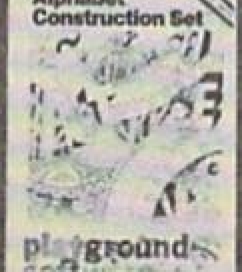
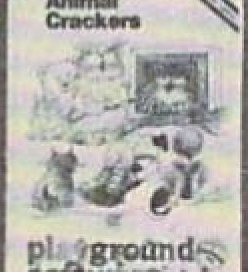

Little Red Riding Hood
playground software


Alphabet Construction Set
playground software


Animal Crackers
playground software

Computer Crayons
playground software

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Circle Reader Service No. 8

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of Commodore Electronics, Ltd. and Atari, Inc., respectively.

The manual offers a description of the models, general operating techniques, specific computer instructions (for the Commodore 64, Apple, IBM PC, and RS-232 interfaces), as well as troubleshooting and optics selection/lighting techniques tips.

Furthermore, it provides technical data on communication between the computer and camera, OpticRAM specs and transmission and baud rate information. Completing the advanced sections are assembly language routines for the IBM version and a detailed description of the hardware. There are diagrams aplenty for those interested in such esoteric matters as interrupt generator and command receiver circuits.

Of course this advanced material isn't necessary for the average user to unleash the potential of this amazing device.

Operating the MicronEye

Basic use of the MicronEye is amazingly simple. Once connected to the 64 with the software booted up, taking pictures is just a matter of lighting, focusing, making f-stop adjustments and selecting special options with a few keystrokes.

For non-camera buffs, the f-stop control adjusts the amount of light allowed through the lens while the focus control aligns or focuses the image onto the OpticRAM device.

Normally the Bullet works best when viewing objects at least 18 inches away. To overcome this situation, the close-up ring allows the viewing of objects as close as five inches.

This ring, which extends the focal length of the F1.16 16 mm lens, is inserted between the lens and the OpticRAM. After that it's just a matter of focusing the lens to provide a clear image of the subject.

For a lot of detailed work, Micron recommends that a true close-up lens be purchased. Since the MicronEye uses standard C-mount lenses, replacement or special purpose lenses that fit can be found at most camera shops.

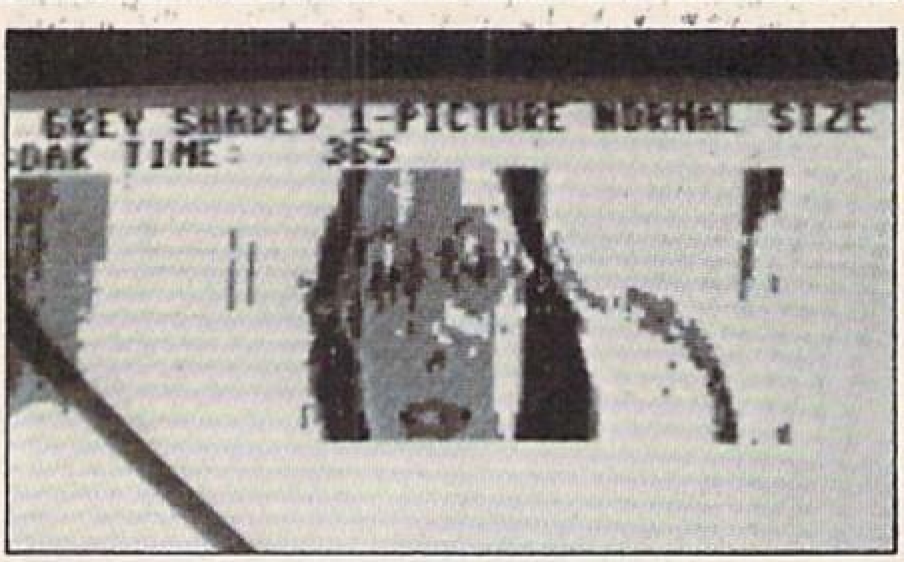
Lighting Techniques

Since the OpticRAM, due to its digital nature, responds only to black and white, a lot of light must be focused onto the subject.

An arbitrary threshold determines whether a pixel becomes black or white. Segments of the scene lighter than the threshold are rendered in white, those darker in black.

This threshold can be altered by changing the f-stop setting, adjusting the exposure time or varying the amount of light on the scene itself.

Scenes can either be front or backlit, depending upon personal preference, the object being photographed or the amount of ambient light already present.



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GREY SHADED 1-PICTURE NORMAL SIZE
OAK TIME:     355
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As you gain experience you can create shading with the Bullet.

Two pages of instructions, with some additional input from an appendix, aid in understanding the need for sufficient lighting as well as how to achieve it.

Using the MicronEye with the 64

The chapter covering the camera's use with the 64 gives brief, yet adequate, instructions on how to install and set up the unit.

A listing of files on the disk is also included to help users develop their own custom applications.

The main program, aptly titled the MicronEye, allows the non-technical user access to a great deal of the unit's power and abilities. It allows pictures to be shown on a video display, to be saved and loaded to and from a formatted disk and to be reproduced as a hard copy by either an Epson or a Gemini graphics printer.

Since the Bullet operates with the interrupts switched off, keyboard entries must be held down a bit longer than normal for them to register. After a few tries this holding action becomes second nature.

Command Summary

Depressing the "B" key activates the black and white mode. This is used mainly to return the device to a standard setting after the gray mode has been invoked by hitting the "G" key.

While operating in the gray-shaded format, the camera is instructed by the computer to take three pictures at various exposure times. These are then combined to produce a multitoned gray display of the object being scrutinized. Due to the complexity of this format, it operates at a much slower pace than the straight black and white mode.

Though meant to display only one picture per screen, the fact that the OpticRAM has two arrays allows it to show two photos of the same object. Pressing the "2" key projects the second photo directly below the first. This second shot has a tendency to be a bit darker than the "original". Depressing the "1" key returns the display to a single photo.

Hitting the "E" key kicks in the enhanced mode which effectively increases the resolution by four. Images sent to the screen are now 256 × 128 instead of 128 × 64. Achieving this clarity takes time as each picture not only takes four times longer to develop, but then has to be passed through an enhancement algorithm to produce a clear, crisp image. Nevertheless, the final product is well worth the wait. Depressing the "N" key resets the camera to the normal mode of 128 × 64.

Using the shifted period and comma keys increases or decreases the exposure time by 10 milliseconds respectively. Likewise, each keystroke of those unshifted keys has the same effect except that the exposure time is altered by only one millisecond.

Typing "S" saves a picture to a formatted disk, while "L" loads it back. Hitting "P" sends the data to a printer for a hard copy. Lack of interface ability with the Commodore 1525 or 1526 printers is probably the most serious drawback of this entire unit. Most people have Commodore printers, so there is a definite problem here.

The return to BASIC is accomplished by depressing the "Q" key to quit the MicronEye program.

Other programs on the disk are concerned with assembly language routines that expand the camera's personalized uses and are too technical for this article.

In case of any difficulties during use, a troubleshooting appendix runs down some of the common sense problems usually encountered. Absolutely no technical data here. As a matter of fact, the firm's number and address are included if there is a need to go beyond the general help offered.

Practical Uses

If you're sitting there thinking "Wow, this is a great piece of equipment, but what can I do with it?" just think for a moment longer.

Photos of yourself, your friends and family, as well as objects in your close surroundings can be digitalized, saved and reproduced.

With the close-up ring installed, pictures of text can be taken, though several passes are needed to capture a full page.

School projects or business presentations can be greatly enhanced through this technological wizardry.

Combine some creativity with a touch of entrepreneurial chutzpah and it may be possible to earn a few dollars on the side producing posters, term paper illustrations, or anything else which lends itself to photography.

Enhancements

Besides acquiring various lenses for different shots, it is possible to use readily available software to color and further manipulate the files stored to disk by the MicronEye.

One of the easiest units to interface with is Inkwell System's *Flexidraw* including Pen Palette. This penware package (professional grade lightpen with software) can color the pictures taken with the MicronEye. It also provides templates of Greek alphabets, architectural shapes and several other options which can enhance the photos. Perhaps the most spectacular option is the ability to send photos (colored or otherwise) via modem to someone else.

Sorcerer's Apprentice by Event Horizon Software is diskware which can also be used to add hues or coloration to the illustrations produced by the camera.

The Bottom Line: Hands-on Experience

I can make several points after spending considerable time using the camera.

First of all, text resolution on the 64 version is not very good. Copying important data this way isn't practical. Of course it wasn't intended for mass storage of written documents, though this is possibly one of the best areas for future development.

Secondly, the camera is extremely light sensitive. Careful attention must be paid to lighting requirements. For good results semi or fully professional equipment is needed. For experimentation or casual use of a relatively unimportant nature, flood lights, backdrops and improvised indirect lighting items will suffice.

Be prepared for some frustrating sessions because patience is required to produce that perfect picture, at least until one's proficiency increases.

A way around the limited printer compatibility problem is to use the *Flexidraw* program to print to a Commodore 1525 or equivalent, a C.Itoh Prowriter or an Okidata Microline.

The MicronEye is an interesting device which hasn't been fully developed technically or application-wise. As time goes on, upgrades will no doubt be performed and other uses will come to light thanks to the efforts of individual users testing new ideas. **C**

Circle Reader Service No. 507

PowerPad with Leo's 'Lectric Paintbrush and PowerPad Programmers Kit

By Francis Amato

Are you a frustrated artist? Get urges to finger-paint? Do you wish to play piano or do a jigsaw puzzle without losing any pieces? The PowerPad from Chalkboard Inc. might be just what you need.

The PowerPad is a $99.99 touch tablet for the VIC 20 and Commodore 64. It's used like other alternate input devices such as mice, light pens or joysticks. Locations on the pad correspond to locations on the video screen. As a drawing aid, press the tablet and an image appears. Locations are the keynotes when used in a musical program. The tablet can replace the keyboard or move an object around the screen. The possibilities of any touch tablet are only limited by the software using it.

For that reason, this isn't solely a review of the PowerPad. The PowerPad is similar to a computer. It can do nothing without software. This review will be as much about Leo's 'Lectric Paintbrush (supplied with the PowerPad) and the optional Programming Kit as the PowerPad itself.

The PowerPad package contains the tablet and Leo, a finger painting program on cartridge. There is also an operating booklet, cable, a Mylar overlay used with Leo, a plastic stylus and a number of PowerLog cards.

The 36 page operating booklet is easily understood. It tells you everything you need to know about using the PowerPad with Leo's 'Lectric Paintbrush. It tells you nothing else, however. You'll have to buy the $29.95 Programming Kit if you wish to know more.

The cable is a five foot long telephone cord with a joystick connector grafted onto one end. It plugs into control port one and the top of the PowerPad. I appreciate the length because it's handy. It would be possible to construct a cable should the supplied one break. However, you cannot use the keyboard when the PowerPad's plugged in. There must be a way, but I don't know what it is.

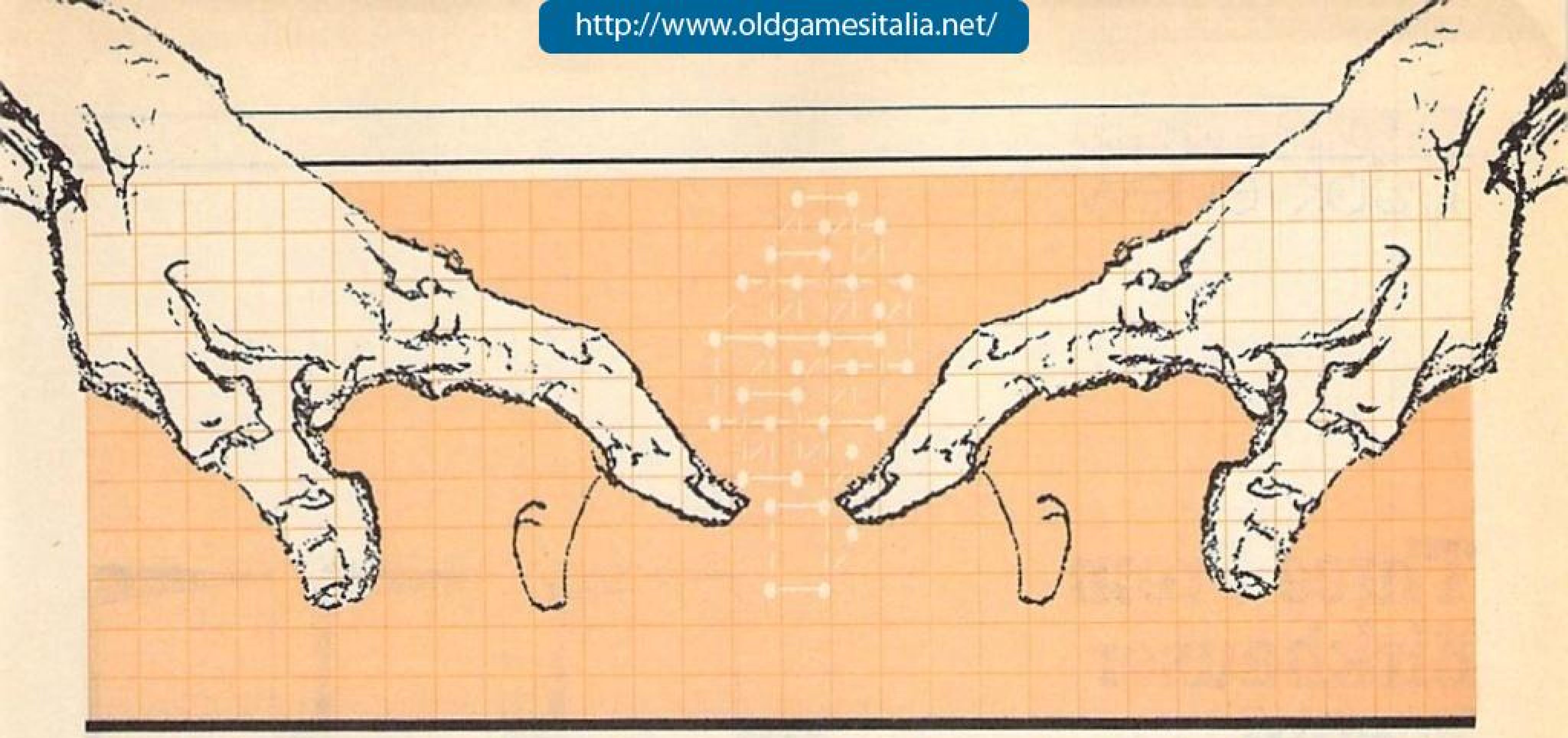
The PowerPad comes with a 90 day limited warranty. Return it to the store where purchased if it breaks within the first 30 days. After that, you have 60 days to ship it to Atlanta for repairs. Replacing the overlay costs $6.

Physically, it's a 17 inch by 20 inch plastic case with a handhole on the left side. The touch sensitive area is 12 inch by 12 inch, large enough for 14400 distinct locations which can be interpreted and acted upon by the software. A grid of wires beneath the surface registers input. Unlike many touchpads, this one will accept more than a single touch at one time. You could press five fingers on the pad and have five different contact points. A potentially valuable feature.

The only failing of the PowerPad itself is one of sensitivity. It won't register an input unless your touch is quite firm. I don't know if this is intentional or a design limitation. All I know is it's quite aggravating. It's difficult to achieve a smooth flowing line when you have to press so firmly.

The PowerPad with Leo's 'Lectric Paintbrush is being marketed as an educational device. Leo's 'Lectric Paintbrush is more than adequate for this purpose. Just realize you're not going to create artistic masterpieces with it. Well, perhaps abstract ones. Have you noticed in ChalkBoard's advertisements what Mona Lisa looks like? That's what you can expect. A great master like Leonardo wouldn't be working with Leo's 'Lectric Paintbrush. Unless he was well paid.

The Mylar overlay allows you to choose one of eight colors (even though the computer allows 16) as a background, pen, or fill color. You use PEN



UP and PEN DOWN to move to a spot and start drawing with your finger or the enclosed stylus. You can make a reasonably fine line. Be careful not to draw too far towards the edges. You'll end up with part of your picture on one side and the rest of it on another.

You can duplicate or move a shape by defining it with the TO and END keys. You have to decide in advance or it will be too late. Defining a shape takes up quite a bit of memory. Press the hashmark key (#) and a gauge appears to show how much is left. You can un-define shapes to free up some of the memory or use CLEAR to erase the picture.

What if you decide to erase a line? You're out of luck. You can cover but you can't erase. To cover, choose a pen color that matches the background and paint over the mistake. A tedious and inexact way of doing things.

Your compositions can be saved or loaded from disk or tape. Unfortunately, there are no letter keys on the overlay. No chance of saving or loading a picture by name. The COLOR keys are used instead. Press up to three of the COLOR keys, such as RED-BLACK-YELLOW. Anytime you wish to admire it, you must load it from the pad by pressing RED-BLACK-YELLOW. That's why PowerLog cards are included. You're supposed to write down the COLOR keys pressed and what the picture was.

Using Leo is certainly easy. Unless you're very young, however, you'll soon grow tired of it. You'll find yourself wanting to do more and it won't let you.

The Programming Kit is an overpriced ($29.95) accessory which allows you to exploit the PowerPads' potential. The kit contains a blank gridded overlay, three PowerLog cards, some stick-ons, two overhead projector markers and a 42 page booklet explaining how to incorporate the PowerPad into your own programs. Also included is a free membership to the Padmasters Guild Users Group (a $9.95 value). All this should have come with the PowerPad.

The programming booklet is well written and easily understood. It includes five programs listings in BASIC and BASIC with machine language subroutines. It's useful but doesn't go far enough in illustrating how to use the PowerPad. It'll teach you the basics, but then you're on your own.

Should you buy the PowerPad with Leo's 'Lectric Paintbrush? Only if you can answer yes to one or more of the following questions:

1. You're buying it for educational purposes. Children find it a lot of fun. It's certainly durable. The size makes it easy to handle. The corners are rounded so nobody can get hurt. It could be very useful for the physically handicapped.

2. You have a color TV or monitor. Color will make a big difference in your compositions.

3. You're planning to incorporate its features into your own programs.

4. Your expectations of Leo's 'Lectric Paintbrush aren't very high.

Leonardos Library of programs for the PowerPad currently numbers eight. Don't expect lots and lots of programs in the near future. ChalkBoard doesn't encourage third party products. All the software for the PowerPad will probably be developed for, and certainly marketed by, ChalkBoard.

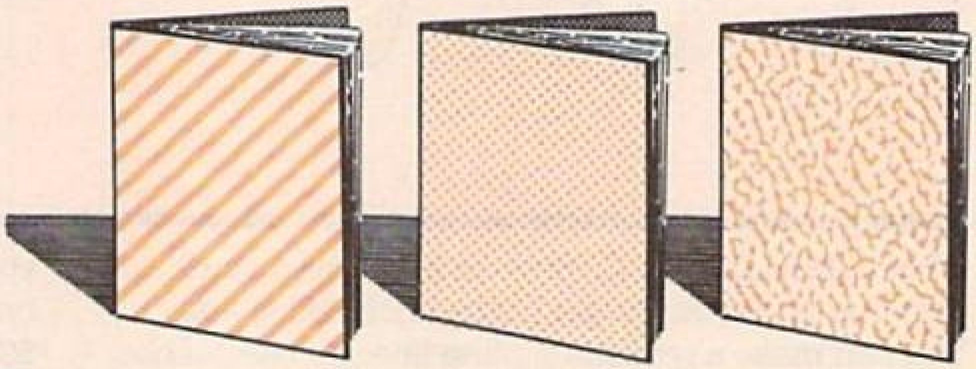
The PowerPad is a bundle of potential which Leo's 'Lectric Paintbrush barely exploits. I would buy it for what it could be, not for what Leo's 'Lectric Paintbrush makes it. Leo is gruesome. The PowerPad is great.

C

Circle Reader Service No. 512

Three From Birkhauser Boston

Reviewed by Annette Hinshaw



An Introduction to the Commodore 64
By Nevin B. Scrimshaw and James Vogel

Discover Your VIC 20
By Donald Kahn, Jr. and Nevin B. Scrimshaw

The Commodore 64 Music Book
By James Vogel and Nevin B. Scrimshaw

Many new owners of Commodore computers are a little shy of programming. The user's manuals and most other programming books seem to assume a base knowledge these novices don't have. Programming books are often (a) dull, (b) written by math teachers who think SQR is an important BASIC function or (c) written by business types who think color and sound are for games and other low uses. *An Introduction to the Commodore 64* and *Discover Your VIC 20* are for real beginners, are not dull and provide excellent introductions to the sound and graphics capabilities of the 64 and the VIC, respectively.

The two books are very similar in general outline and approach. They even share some of the same example programs. The chapter on string functions is called "Microsurgery" in both books and uses not only the same programs but almost the same language. Written in an easy, conversational style, both books begin with the keyboard. Instead of involved technical discussions of BASIC functions, the authors give short, simple explanations of programming mechanisms. The reader will learn (he should read with computer in hand) most by keying in the short example programs and seeing them run.

Every program is explained in the text, almost line by line. REM statements in the programs add to the documentation. The programs are short, easy to read and fun! Almost painlessly, the authors take their readers through most of BASIC, the fundamentals of program design and a good introduction to using graphics and sound on these two Commodore machines. As Commodore users know, making graphics and music on these computers comprehensive to a beginner is a feat in itself.

Discover Your VIC 20: A Beginner's Guide to Real Programming is a title that delivers what it promises. The book on the 64 is more modestly titled, but it also delivers a beginner's guide to using the 64's special abilities. While the two books are for the newcomer who has no computer experience, old hands can profit from the tips on using color, bit mapping and learning how to make a playable organ out of their computer keyboards. Anyone who works with hi-res graphics will appreciate a complete "Character Design Chart" which shows the bit distribution of numbers through 255.

These two books won't make expert programmers out of anyone. What they will do, for those who read the books with their fingers on the keyboard, is provide the broad foundation from which experts can grow.

A third offering from Birkhauser Boston, *The Commodore 64 Music Book: A Guide to Programming Music and Sound* will get you excited about using the 64's SID (sound interface device). Chapter 3, called "Waveforms", for example, describes with pictures the five waveforms available on the 64. A 20-line program plays a well known piece, *The Flight of the Bumblebee,* in each waveform successively. The reader who keys in the program, which is short enough to be encouraging, can *hear* how each parameter sounds. Each of the technical parameters in using the 64's considerable musical capability is presented briefly in simple language with appropriate and amusing example programs. Beginner or expert, musician or not, anyone who wants to try the Commodore SID (which is reputed to be one of the best synthesizer chips available) can profit from this book.

Commodore users have long known that the 64's graphic and music abilities are second to none. Unfortunately, the programming to get to those features can be awkward and unhandy. Doing music is especially difficult for those who do not have a good technical grounding in music and sound generation. As a result, we see less exploitation of the SID than it deserves. This book doesn't make the programming of sound less clumsy, but it does make the necessary concepts of music and the physics of sound understandable to anyone, thus removing a major block from the paths of many nonmusical programmers.

The book begins with an overview of concepts: sound, frequency, pitch, waveforms, the envelope generator, filters and various types of modulation. Example programs which demonstrate how each parameter changes the sounds let the user hear the differences for himself. As the authors proceed through the mechanics of programming music and other sounds on the 64, simple programs and diagrams illustrate every idea. An extensive "SID Chip Control Chart" and a table of note values are provided for ready reference. Diagrams which show how bit controls work in the SID chip are especially enlightening for a novice programmer.

In case the reader is not highly experienced in BASIC, the authors provide some explanations of standard programming mechanisms such as loops as they are needed. More intermediate mechanisms such as READ, DATA and the use of arrays are covered more thoroughly, since they are essential to the application. None of the material is dull or pedantic. Just enough textual information is given to keep the programmer moving. The programs themselves do most of the teaching.

The book is short, but exceptionally well done. By the time a reader works through it, he will have an excellent grasp of how to use the 64's sophisticated synthesizer. A musician will have a new instrument to master. And less artistic programmers will have a new dimension to add interest to their programs. **C**

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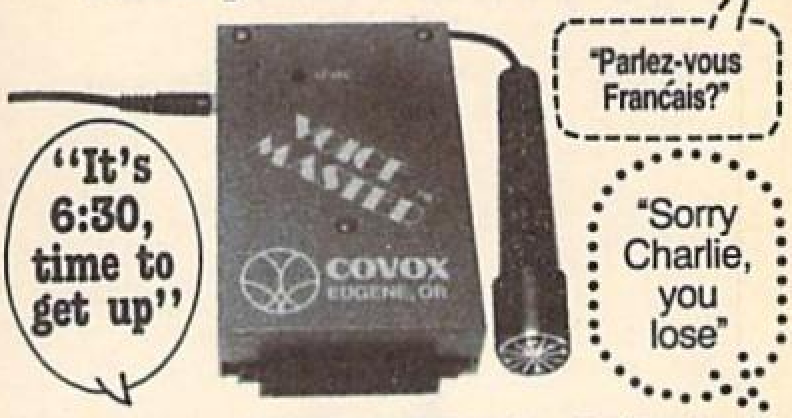

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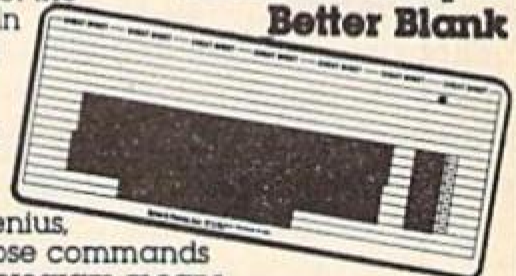

O.K. So now you've got the best Commodore 64 in the world, and lots of complex software to run on it. One problem. Unless you work with some of these programs everyday or are a computer genius, who can keep all those commands straight? "F5" in one program means one thing, and "F5" in another program means something else. A few companies do offer a solution...a die cut "cheat" sheet that attaches to your keyboard with all the commands of one program printed on it. Great idea, unless you need them for 10 or 20 programs. You could purchase another disk drive for the same investment. Our solution? Simple. A pack of 12 lined cards, die cut to fit your keyboard and just waiting to be filled with those problem commands **you** forget most often. Simple? Yes, but effective. Now you can have **all** your program commands right at your finger tips on YOUR VERY OWN, custom designed "cheat" sheets. Order a couple packs today!

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A Trend Indeed

By Steve Finkel

First there were the hippies, those lovable, radical long-hairs who thrived on dirt and rebellion. After a decade of stereotype stagnation, the preppies burst onto the scene, resplendent in Izod shirts, plaids and L.L. Bean. Preppies set a brisk tone for trendy stereotypes, turning up on paperbacks, stationery, *Time* magazine covers, t-shirts, lunchboxes, college campuses and even in real life.

Trendy stereotypes grew enormously in popularity in the Eighties. JAPs, or Jewish American Princesses, made shopping in all the right places and drinking Tab national pastimes. Everybody jumped on that bandwagon. You didn't have to be Jewish, American or even a Princess to be a JAP. Anyone who was raised by doting, wealthy parents, wore jewelry worth more than other people's homes and could whine while pouring Sweet 'N Low could be a JAP or equivalent trendy stereotype. Who says America isn't the land of opportunity?

Meanwhile, on a parallel reality, Valley Girls became a new lifestyle stereotype that was extremely popular with the media. This is probably because all the interested media members found that their own daughters had developed a new vocabulary and style of dress. Rather than send their kids to expensive psychiatrists, they decided to make a few bucks off of it by publicizing it as a trend. And the rest is history of sorts. When the Valley Girl lifestyle becomes *passe*, there will be a tear in the eye of mall developers everywhere.

More recently, trendy stereotyping has become a trend unto itself. There seems to be a new stereotype lifestyle on the New York Times best-seller list every week. It's getting to the point where instead of asking questions on age, race, sex, religion or political preference, census takers will merely request your stereotype.

Anybody can classify a new stereotyped lifestyle. In fact, those who do are numerous enough now to be part of a trendy stereotype of their own: the Lifestyle Organization Stereotypist, or LOSer. Into this illustrious though suspect classification plunges the Joystick Lunatic, introducing yet another new lifestyle stereotype: the home computer video game player, a form of humanity whose habits, qualities, tastes and idiosyncrasies can be classified and catalogued into a coherent trendy lifestyle for the eighties. This is probably a great relief to many parents, who were doubtlessly worried that their home gamers were destined to spend the decade joysticking in complete obscurity. Well, chin up, folks—nothing can put you on the national memory map (not to mention the cover of *Time*) like a catchy stereotypical lifestyle!

The Video Educated Gamer, or VEGie (pronounced like the slang term for vegetable but not an editorial comment on gamers), has definite characteristics unique to the stereotype. Where the odd Preppie may undertake home computer gaming as light entertainment, it just doesn't wash on the Cape or at prep school. While the occasional JAP gamer might play against her date for fun, the possibility of a broken nail or getting muscular hands from using the joystick are deterrent enough. The true VEGie holds games in a spirit of reverence similar to that which a boll weevil holds cotton. The VEGie does not just play games. The VEGie believes in them, thrives on them, communicates with them and understands them.

There are several ways to tell VEGies apart from the rest of the world. When someone yells "Fire!" in a crowded movie theater, VEGies will go for the joystick rather than the exit. A VEGie might not know how to screw in a lightbulb, but can plug in a game cartridge on any of a dozen machines. VEGies can also be identified by their unique posture abilities—they are able to sit or lie in any position on any floor or piece of furniture and still effectively complete a game screen. Some of the trendier VEGies can even break dance while getting a high score and never become tangled in the joystick cord. (This should turn up on "That's

Incredible" any week now).

Those traits that set VEGies apart are related to their gaming propensities, and that holds true for names as well. You won't find a Muffy or a Rhonda in this crowd. Popular handles include: Ace, Hawkeye, Action, Alienbreath, Assassin and The Kid. Similar nicknames are popular for male VEGies as well.

An area where VEGies again assert their uniqueness in comparison to other trendy groups is fashion. VEGies dress in normal clothes: jeans, cords, sneakers, shorts, t-shirts, sports jerseys (not all at the same time; they won't even wear two shirts at once). VEGies never dress for success. They strenuously avoid Preppie clothes, particularly anything Izod. The closest they'll get to an alligator is crossing the stream in *Frogger.* VEGies tend not to wear jewelry since it weighs them down although the occasional bracelet or ring is sometimes used by less ethical players to distract opponents. The more flamboyant VEGies might occasionally wear hats with antlers or arrows through their heads.

VEGie food doesn't match up to other trendy group meal fare. No croissants, no yogurt, no salad bars, no diet soda and definitely no quiche... VEGies mainly subsist on junk food. For some VEGies, the standard meal often consists of devouring cherries, followed by strawberries, peaches, apples and grapes. Of course, the VEGies who don't play *Pacman* at home follow a steady diet of other gaming fare.

VEGies, by and large, conduct their lives like other people, outside of their obvious indulgence in home computer games. VEGie intelligence levels range from average to genius (thereby excluding the bulk of Valley Girl video fans as legitimate VEGies). They make up a substantial portion of the under-30 segment of the population. As such, there is enormous potential for financial entrepreneurs. (The Joystick Lunatic frowns on commercial exploitation, at least until the Joystick Lunatic t-shirts hit the market.) VEGies, for the most part, don't seem to mind because it keeps them and their interests in the spotlight.

The early attempts to cash in on the trend produced video-oriented cereal and cartoons. VEGies did not wholeheartedly support these efforts, recognizing them to be as unnatural as a fur-lined joystick with a rearview mirror. New attempts to tie VEGies' gaming lifestyle to more cultural concerns are under development. For example, many publishing houses are signing contracts with home computer game manufacturers in an effort to convert classic literature to a form acceptable to VEGies. Ready to hit the bookstore shelves are such works as Shakespeare's *PacBeth*, about a medieval prince whose wife (Ms. PacBeth) pushes him to gobble up all the power pills to be king. A more recent fictional conversion is *GORFy Park*, an intense espionage thriller in which a Russian police chief has to outwit the KGB and his superiors, as well as the Gorfian Commander. Fittingly, the Gorfs are decidedly red. Other literary achievements include Tolstoy's *Wizard of Wor and Peace*, F. Scott Fitzgerald's *Defender is the Night*, and the Hemingway classic *The Old Man and the Seawolf*, to name a few too many. These books, although noble in their aim, probably represent the final blow to western literature as we know it.

What does the future hold for VEGies? Will they become a major political force, wooed by self-serving candidates promising legislation to establish minimum graphics standards and filibustering for congressional recognition of national high score holders? Or will they settle gracefully into their role as a trendy stereotype, frequenting the trendy stereotyped arcades, malls and restaurants that have sprung up to serve them? Will they buy the posters and record albums that at first legitimize and later satirize the VEGie trend? VEGies stand today at an important crossroad, with the initial impact of *Pacman* fading (the "Pacman Fever" single sleeps in outdated jukeboxes, seldom being prodded into consciousness by an intrusive quarter) but with the number of serious gamers ever on the rise. At this point in time the trend could take off in either direction.

Perhaps the most telling indicator for the future of VEGies is the growing VEGie baby boom. "Boom" is itself a term that is close to the heart of every VEGie (old sound effects die hard). More and more VEGies are getting married and raising a new generation of computer game babies, teething on joysticks and staring contentedly at the monitor screens hung over their cribs. New stages of child development are being incorporated into the old Freudian stages, corresponding to the mastery of specific phases of gaming. The child able to manipulate a joystick well at the age of four will make his parents proud enough to show off the kid's game-playing ability in front of their friends. (Their friends will of course be uninterested.) All of this bodes well for the future of the VEGie lifestyle.

One final question, however, remains to be considered: in a future world dominated by VEGies, will the non-gamers be considered a trendy stereotype lifestyle of their own? Think about that while the game is in demo mode. C

Children of Kong

By Neil Harris
Director/Publishing

Once there was a game called *Space Panic*. This was an arcade machine, or "coin-op", in the old days before *Asteroids* and *Pacman* started the video game craze. The main character ran up ladders and across beams while a motley group of aliens pursued. You probably don't remember the game. Neither did the arcade customers.

It was resurrected in thin disguise as *Apple Panic* in a version for home computers. Here its following grew, perhaps achieving the status of a "cult" game.

Then came the breakthrough from Nintendo, a Japanese development company. The new game consisted of three different screens and the graphics were given a dramatic facelift. The game was meant to be called "Stupid Monkey" but was mistranslated in English as *Donkey Kong*, and is now a star on computers, TV and cereal boxes.

The game of *Donkey Kong* consists of three different screens. The first and easiest has falling barrels, which are very predictable, as your obstacle while you try to reach the top. The next round requires that you collect all eight rivets from the beams and this is made tougher by the collection of semi-intelligent fireballs that roam around. The third round requires split-second timing to jump onto the dumbwaiters and avoid the falling springs.

AtariSoft's translation of this program to the Commodore 64 is excellent, by the way. They've captured most of the sound effects, graphics and play action from the arcade game.

The Kong Family

The enormous success of this game has created a genre of computer games, a kind of "Kong Family". All the games star a human figure as the main character, who runs and climbs under joystick control. Each has monsters or inanimate objects trying to tag (or kill, or eat) the human and all have many different screens to add variety to the game. The other similar feature is that they're all fun to play.

The seven games (all in versions for the Commodore 64) I could get my hands on are: *Jumpman* and its sequel, *Jumpman Junior*, both from Epyx; *Lode Runner* from Broderbund; *Frantic Freddie* from CDS; *Dino Eggs* from Micro Fun; *Hard Hat Mack* from Electronic Arts; *Miner 2049er* from Reston; and *Crazy Conveyors* from Bytes and Bits. There are at least two more games in the same family I couldn't get my hands on: *Apple Panic* (yes, a translation of the original) from Creative Software and *Floyd of the Jungle* from MicroProse.

Even though all games are very similar to each other, there are many striking differences. Rather than try to review any one game, I'll try to give you an idea what the similarities and differences are and to tell you which ones I like.

To start, here is a chart of the measurable differences among the games.

	Screens	Create	Monsters	Hit Fire	Time
Donkey Kong	3	No	Both	Jump	No
Jumpman	30	No	Both	Jump	Yes
Jumpman Jr.	10	No	Both	Jump	Yes
Lode Runner	150	Yes	Smart	Dig	No
Frantic Freddie	9+	No	Smart	No	No
Dino Eggs	10	No	Dumb	Dig/Jump	No
Hard Hat Mack	3	No	Dumb	Jump	Yes
Miner 2049er	10	No	Dumb	Jump	Yes
Crazy Conveyors	16	Yes	Smart	Shoot	Yes

Screens

Some of the games had a large number of screens. In *Lode Runner* there are many different screens, but they all look alike after a while. In fact, there are only nine distinct objects on the screen, as you discover when you create your own screens.

The ladders in *Frantic Freddie* work differently from all the other games. The human character cannot walk past ladders, but must go up or down. The monsters can violate this rule, which makes the game very tough unless you're fast and tricky. The screens in all the levels of this game look alike, differing only in the arrangement of the ladders.

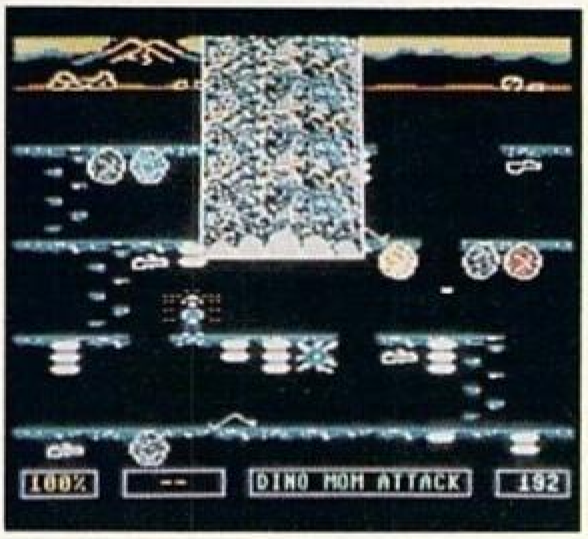
The screens in *Dino Eggs* are randomly arranged at the start of each level, so the screens look very similar here from round to round. To dress things up a small hi-res scene in the top inch of the screen changes for each round.

Hard Hat Mack and *Donkey Kong* only have a small number of screens. To make up for this, each screen is very different from the others. Once you've gone through all three screens, no mean feat, you return to the first screen with more monsters.

Some of the screens have objects that help or hinder movement. *Jumpman* has a floating ladder and floating platforms, *Crazy Conveyors* has conveyor belts that switch directions, *Donkey Kong* and *Hard Hat Mack* have what I call "dumbwaiters" to raise or lower your character, *Miner 2049er* has transporters which act as elevators and *Lode Runner* has invisible trapdoors.

Create Your Own Screens

Lode Runner and *Crazy Conveyors* are enhanced by the ability to edit and save your own screens. If you get tired of *Lode Runner's* 150 screens (I'll bet very few have taken the time to see them all), you can have fun inventing your own. This is trickier than it looks, not in creating the screens, since the editor is very easy to use, but in creating screens that are solvable! Most arrangements take trial and error to perfect. You can exchange screens with your friends and challenge each other!



Dino Eggs

Monsters, Barrels and Bullets

To complicate your journey up the ladders, you're either chased by some monsters or you must dodge some kind of object.

In *Lode Runner*, the monsters chasing you look and act like yourself. They have the same abilities your character does. The only trouble is that you're outnumbered. The monsters here are the type I consider smart, because they don't follow any simple pattern. However, if you watch them carefully you'll see that they try to achieve certain simple objectives like reaching the same height on the screen as you do. As you learn the game, you'll become an expert at using these objectives against them.

The same strategy holds for *Crazy Conveyors*. You're outnumbered by the monsters, but their simple patterns make them easy to outguess.

The fireball monsters in *Donkey Kong's* second round are also smart, but the barrels in the first round and the springs in the third are dumb obstacles. They fall, subject to the law of gravity and the location of ladders and beams. Although the springs are dumb, what makes them tough is their speed.

Frantic Freddie suffers from cheating monsters. The problem here is the ladders—you can't run past them but the monsters can. This makes it much easier for you to get trapped in a dead end.

In *Jumpman*, flying bullets are the main nemesis. They cruise along slowly until you're in a direct line from them, then—Pow!—they take off at you. The bullets only cheat a little. They can travel just off the edge of the screen where you can't see them. This makes it a good policy to stay away from the borders of the screen to avoid ambush.

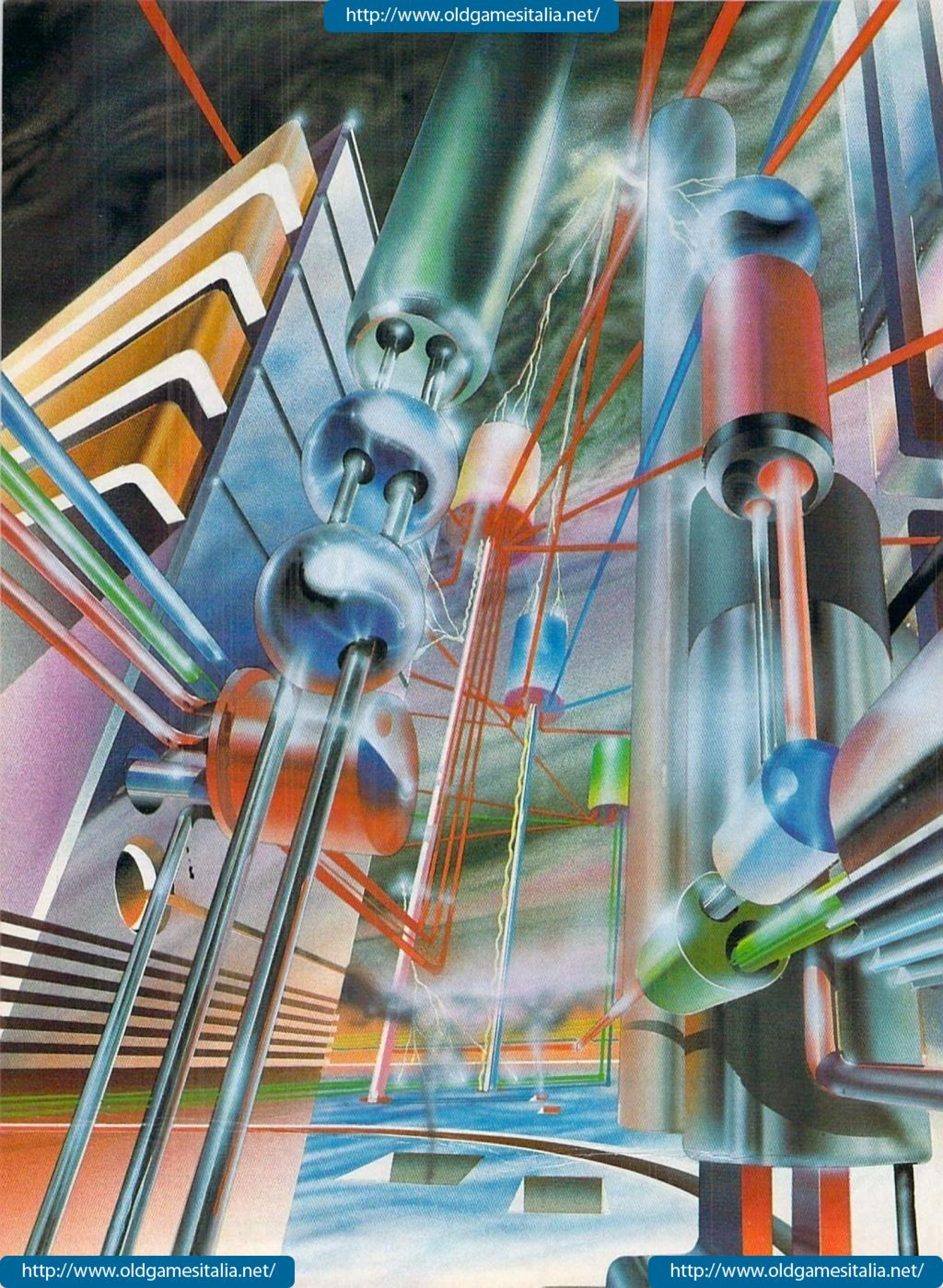
Dino Eggs has the most appropriate monsters: spiders, snakes, flying reptiles and the awe-inspiring foot of the Momma Dinosaur. The foot takes up about 25% of the screen as it crushes anything underfoot. *Dino Eggs* also has one of the most pitiful sights in any video game, as nasty twitchy spiders carry cute little baby dinos to eat as a snack. The graphics make you really want to do your job, more out of humanitarianism than for the points!

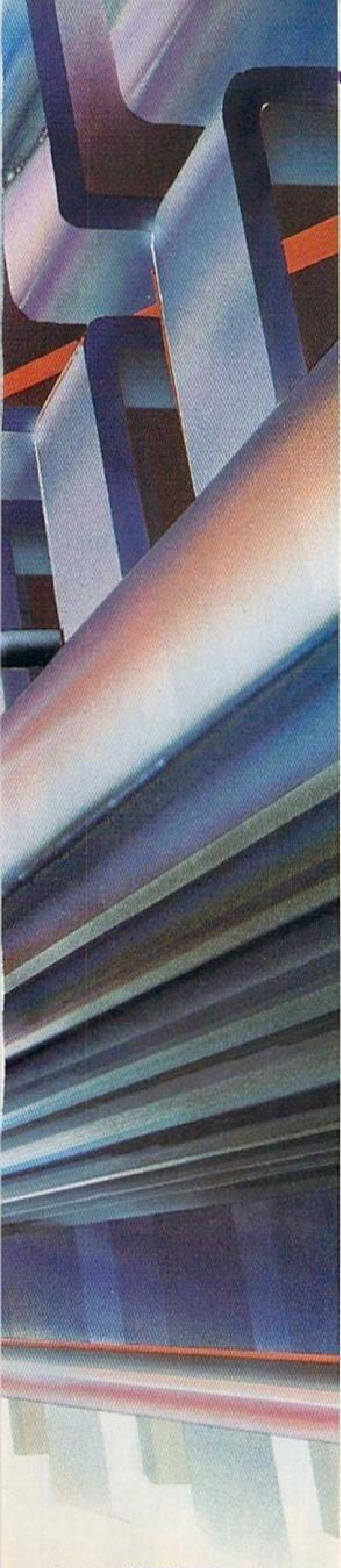
Dino Eggs also lets you run off one side of the screen and onto the other. This takes some getting used to if you've been playing any of the other games, where you crash into a wall at the edge of the screen. Falling doesn't hurt you, either, which is handy when facing all the horrors this one has to offer.

What Happens When You Hit the Fire Button

Most of these games let you

(Continued On Page 68)





Computers Computer Groups and Who Needs Them

If you've ever wished you had someone to ask about that program you just can't get to work, need some advice about which printer to buy or just plain wanted some friends you could talk to about computing, then a Commodore user group is for you.

By Peter J. Baczor and Mark Cornacchio
Commodore Customer Support

Have you ever found yourself in your local computer store asking yourself, "Should I buy *Super-Duper Mailing List Program* or *Terrific Database?"* What about this morning at 4 A.M. after trying for ten hours to debug the program you entered from your favorite computer magazine? You probably found yourself cursing the computer and swearing the little red LED is really a super-intelligent being in disguise trying to make a total fool out of you.

How about when you sat down to write a program to keep track of your coupons? Having taken a semester of BASIC in high school or college you set out on a seemingly simple venture. After three hours of constantly entering code and correcting SYNTAX ERRORs, you are finished and proud as a peacock. Before calling your friends for the grand premier of "My Coupon Directory", you take one last precaution of running your seemingly bug-free program. Everything seems to be working well when all of a sudden the disk drive sputters, the red error light begins to flash and the coupon data cannot be retrieved.

I am sure all of us can relate to these situations and the aggravation we went through trying to get past those traumatic times. Wouldn't it have been nice if we knew what went wrong or, even better where to turn for help.

The salesperson or store owner who sold you your computer can probably help with purchase decisions, but can they help with programming problems? Even more important do either of them have time to help with programming problems? The owner has to run his business to feed his family. The salesperson has to sell computer systems to earn his salary. Although I'm sure either or both of them would be more than happy to help you with your problem, it may be hard for them to find the time. So, as a last resource you may decide to call the computer manufacturer. But debugging programs over the phone can be frustrating and expensive—long-distance calls cost money.

If you only had a friend who knew computer programming you could hopefully get out of this dilemma. Unfortunately none of your friends are as adventuresome as you and therefore you are out here all by yourself.

Don't despair! There is another source of help—the network of Commodore computer user groups. More than likely there is a user group in your immediate area whose members will be more than happy to help you with the problems you are encountering.

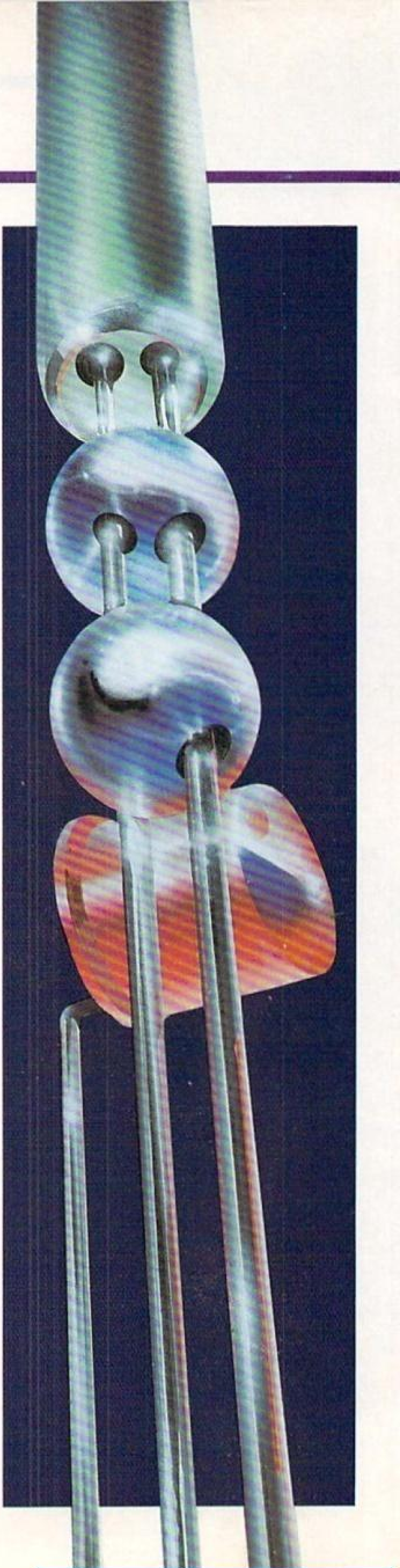
What Do You Gain?

Computer user groups are formed for a variety of reasons but they all have one thing in common—the love of computers and computering. There are groups that cater to a particular computer manufacturer's line of equipment and there are those formed to support a given model computer. Some are formed with a variety of systems represented (this is normally the exception to the rule), and some cater to a particular computer language (e.g., LOGO, BASIC, machine language). Reasons why computer user groups are formed can go on and on. Even the actual organizational structure of the group can vary from a very loosely structured organization that meets informally periodically to a very tight-knit group with a very structured organization.

One of the most common reasons for starting a computer user group is for information dissemination—people exchanging what they know for what they want to learn. Forming a group helps spread information much more rapidly than working individually. Then, once general and broad information is dispersed, individuals within the group may start to pursue specific interests. If the individual members are not selfish, the knowledge gained by them will benefit the entire group.

To cover all the valid reasons for starting a computer user group is beyond the scope of this article and the available print space in this magazine. If you have grasped the idea that computer user groups consist of people who "love computers and computering" and are willing to share knowledge and information pertaining to computers, possibly you are on your way to becoming a contributing member of a computer user group.

If you plan to start (or have started) a user group, I cannot stress enough that its success depends on the entire body of members pulling together and contributing their individual shares. No matter how well you have planned and structured your group, if the members do not contribute you can either start counting the days to the end or run yourself into the ground trying to pull the load for the entire group.



So be sure to encourage participation and delegate *authority.*

Now back to our hypothetical dilemma. Let's assume you have been successful in making contact with a local computer user group and have made arrangements for a representative to meet you and help get you out of your dilemma. Depending on your need, he or she will sit down with you at a computer to help debug your program, explain a complicated software package, demonstrate the latest game or even explain the mnemonics used in machine language programming. More than likely when the two of you get through not only will your program be debugged but you will have learned some helpful debugging and programming techniques that you can continue to use in the future.

Now let's change this a little and take the worst situation. After sitting at the computer for four hours you and your newfound friend are no closer to solving your programming problem than when you started. One advantage of a computer user group is that if one member hasn't encountered the particular problem and doesn't have a solution, there is an entire group of people with varying degrees of computer expertise as a resource for you to tap. You can be sure a solution is forthcoming, eventually. And you will, without a doubt, learn many things about computing as you work through the problem-solving process.

Beyond the obvious benefits you can gain through membership in a user group, there are many secondary benefits as well. Not only can belonging to a group help alleviate the frustrations associated with learning the inner workings of the computer and provide continual educational benefits through club-sponsored tutorials, but you will find that membership also tends to produce lasting friendships. In addition, some groups can also set up discounts on hardware and software purchases and may publish a helpful newsletter or have an extensive software library.

Starting a Group

There may be a remote possibility that a computer user group doesn't exist in your immediate area or the group that is in your area doesn't support your particular equipment or computer languages. Or for some other reason you may decide you will not be able to benefit from and/or contribute to an existing group. One thing left for you to do is initiate the organization of a new computer user group that will support equipment and programming languages that interest you. Remember, if you are interested in a particular topic, more than likely there are others in your area that will have the same basic interests as you.

Organizing any type of group is very strenuous but the results and recognition you receive will be well worth it. Prior to starting out on this venture, be certain that you have time, energy and desire to follow this project through to the end.

But, before you start sending press releases to members of the local news media about starting a new computer user group , you may want to investigate the possibility of becoming a Special Interest Group (SIG) under the umbrella of an organized club. If an agreement can be reached, this type of arrangement can be beneficial to both the existing club and your new SIG.

One obvious advantage of becoming a part of a pre-existing organization is that membership recruitment should be fairly easy. You will have the club's membership as a base to start with. I'm sure some members of the parent organization have been waiting for someone to start a group just like yours. Beside having these members available to your group, you will be able to take advantage of word-of-mouth advertising from the group's members. Therefore, you will be able to attract their friends and acquaintances. In addition you still can avail yourself of free advertising through news releases, placing posters, etc., to attract new members.

Obviously, the existing organization will benefit from added revenues brought in by the addition of new members. The parent organization will also benefit from publicity that will be gotten from press releases, etc. pertaining to the newly formed SIG's membership drive. There are also other advantages, again too numerous to mention, that both SIG and parent organization will experience.

Creating a SIG under the auspices of a parent organization will reduce the amount of time and energy needed to form a new group but if you cannot reach an agreement with an existing club and have a tremendous yearning to form a computer user group please read on.

The first thing that comes to mind when I think of a computer user group is the famous quote from John Donne, "No man is an island entire in itself...". As you embark on your venture you will find it takes many hours of planning and answering the questions what, where and why. To help with the organizational scheme you should probably form a nucleus of three to five people who will be able to help perform the necessary initial organizational duties. Your local computer store, schools, churches and supermarkets can all supply you with space on their bulletin boards to post a note asking for people interested in forming a new computer user group to contact you.

Once the nucleus of your organization has been formed, the next step is to conduct an informal meeting to define the exact purpose that will be the basis for formation of a new computer user group. Remember that the purpose of your group should be sufficiently different from other user groups in your area so as not to conflict with them.

Beside establishing the purpose of the group, other topics that should be discussed at this first meeting are finding a location to conduct meetings and the time and date that meetings will be held. Likely places that should be investigated as possible meeting locations are church social halls, school computer labs or auditoriums or computer stores. Avoid at all costs conducting meetings at someone's home. This can place an undeserved burden upon the meeting's host or hostess. Another reason to avoid this practice is that a newly formed group will have ten or fifteen people attend their first meeting but will often double or triple that number at the next meeting. Conducting a board meeting in a member's home is acceptable because the number of people attending will be limited, but definitely avoid holding a general meeting at any individual's house.

One of the best locations to conduct a meeting is the computer lab at a school in your area that supports your computer. If all the particulars can be worked out this could be a proverbial "marriage made in heaven". Both educators and computer enthusiasts will be able to benefit from such an arrangement.

For instance, most school teachers are not computer programmers and vice versa; therefore, when a teacher needs a customized gradebook program, he or she will have a ready resource for creating such a program within the computer group. On the other hand the computer enthusiast will be able to approach a teacher in the group for help planning a "Learn to Program in BASIC" course to be conducted at the local library. There are also other benefits that both educators and computer enthusiasts alike can gain.

You will also have to decide what day of the week and time of day the general meeting will be held. This can be a tricky decision because of many different schedules and commitments that all members have. Many groups, I know, conduct two meetings per month, one on a weekday evening and another on a Saturday morning or afternoon. This is just one possible solution but you will have to determine what is best for your general audience.

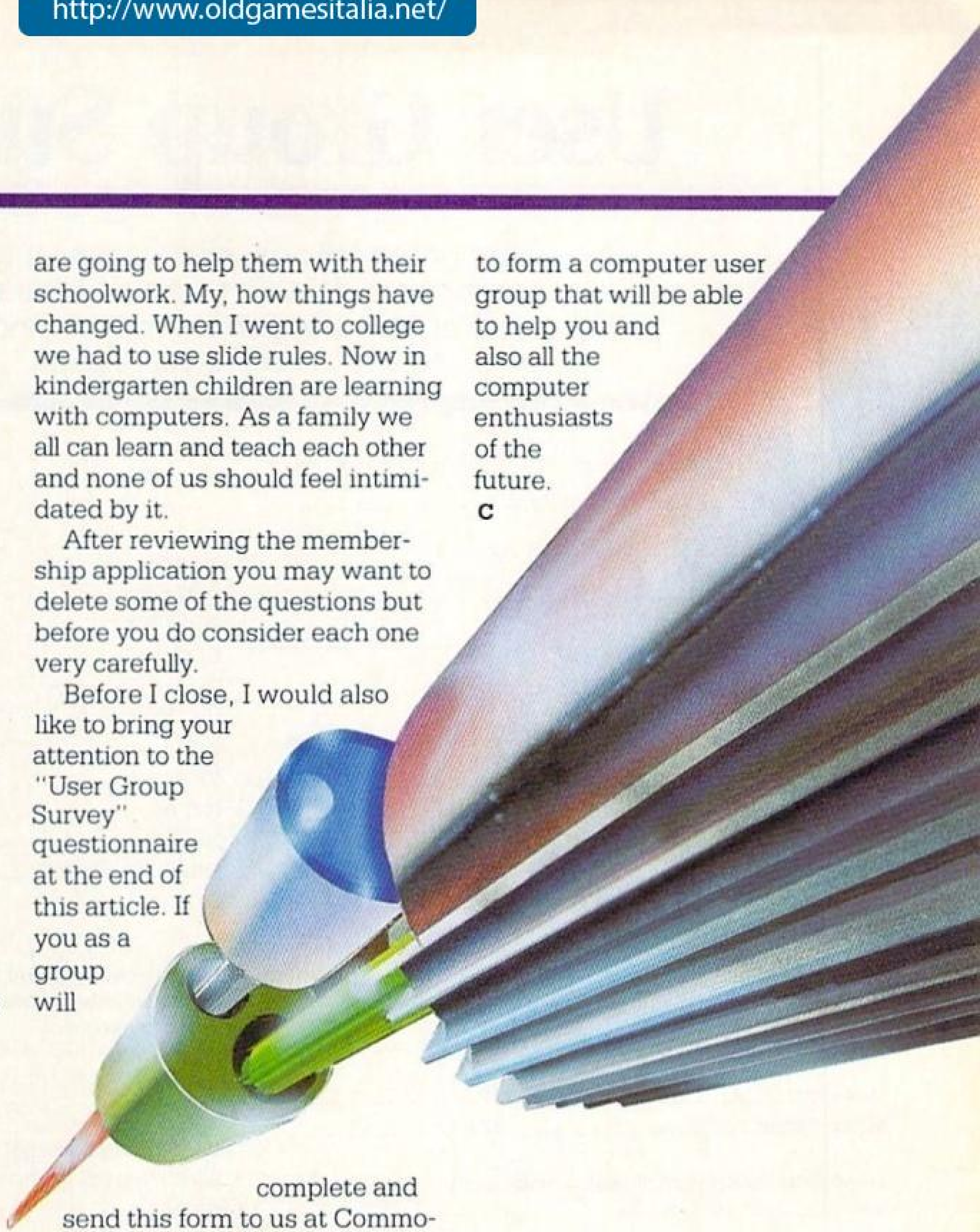
Member Recruitment

Now that you have established why, where and when group meetings will be held, the next thing that must be considered is the recruitment of prospective members. Before we go to the topic of how to recruit members for a computer user group, I believe it is important to interject a few comments.

I am not one to get on a soapbox and preach but I do think it is important at this time to discuss the topic of computer software piracy. I am sure there will be people who, when they see you are forming a new computer user group, will look upon this as a great opportunity to get or copy copyrighted software. As we all know software piracy is against the law, so you should discredit and discourage this practice right from the beginning, before it has an opportunity to develop. Many groups that I have been in touch with go to the point of not even having copyrighted software available for loan through their software library. One last thing about piracy before I go on. Programs you enter into your computer and save from your favorite computer magazine are also copyrighted programs. These programs from magazines are meant to be entered and used only by the purchaser of that particular magazine. The problem of piracy will be a definite issue and there really isn't an easy way to deal with it. Just remember software piracy is against the law.

Let me now return to our topic at hand, recruitment of prospective club members. Sources of prospective members are local engineering companies and companies involved in high-tech industry. Colleges and high schools are also very good sources of prospective members. Probably one of the best sources of names is a computer dealer. One that sells hardware and/or software your group will support can afford you the most usable list of prospects. Also, you may want to post notices in some of the various places mentioned above.

Just as the nucleus of your new group first met to define basic principles of where, when and why, so will the first few general meetings go. In the beginning it is best to conduct your meetings



in a less organized fashion than will become the practice in future meetings. It is important to get your audience to participate in a discussion of what they expect to get from attending group meetings and what they are willing to contribute to support the group. It is even more important for you to listen to what the general audience wants. Another way that you can elicit information from group members is by using an application for membership. At the end of this article you will find an example of a membership application that you can cut out, copy and use for your group if you so desire.

The application may contain more information than you may actually need but, as you will see, this information will help you in the future to maintain a smoothly operating user group. Conducting a course in beginning machine language programming or reviewing the latest flight simulator program are functions your club will more than likely become involved with. By looking through your applications or, better, searching through your database under the programming experience field, you will find that Jim Johnson is a machine language programmer. What better choice than an accomplished machine language programmer who is also a teacher for your course instructor. Also by looking through the programming experience field you may find that instead of a machine language course, an intermediate course in BASIC is needed much more.

One question that I believe should be on every application is whether the applicant is joining as an individual or as part of a family. Those of us with school-age children realize the importance of at least a basic knowledge of computers if we are going to help them with their schoolwork. My, how things have changed. When I went to college we had to use slide rules. Now in kindergarten children are learning with computers. As a family we all can learn and teach each other and none of us should feel intimidated by it.

After reviewing the membership application you may want to delete some of the questions but before you do consider each one very carefully.

Before I close, I would also like to bring your attention to the "User Group Survey" questionnaire at the end of this article. If you as a group will complete and send this form to us at Commodore, we hope to better serve you with follow-up articles and place you on our mailing list. We will also be able to list your group, if you so desire, in the User Group section of both *Power/Play* and *Commodore Microcomputers* magazines. That way people in your area will be able to contact you for help.

In the beginning of this article we wanted to know what went wrong with a program and where to turn for help. I know we didn't answer the "what went wrong" part but I certainly hope that we were able to answer, or at least give you some insight into "where to turn for help", and have given you the basic tools needed to form a computer user group that will be able to help you and also all the computer enthusiasts of the future.

C

User Group Survey

User group officers, please answer these questions and return to the address at the end of the survey so we at Commodore can better serve your needs.

Club Name: ____________________

Member Size: ________ Years in Existence: ____________

Address: ____________________

c/o: ____________________

Address: ____________________

City: __________ State: __________ Zip Code: __________

When are meetings held: ____________________

Time of meetings: ____________________

Where: ____________________

Contact: ______________ Title: ____________

Do you wish to have group information listed in our publication?
yes________ no ________

Are you willing to answer calls pertaining to your organization and Commodore computers? yes________ no ________

Work Phone: ______________ Hours: ____________
Home Phone: ______________ Hours: ____________

Does your organization publish a newsletter?
yes________ no ________

Name of newsletter: ____________________
(If your answer is "yes" to the above question, could you please add my name to your mailing list and attach a copy of your last newsletter?)

How often is the newsletter published? ________ times per year

Does your organization operate a telecommunication Bulletin Board System? yes________ no ________ (If your answer is "no" skip the next question)

What is the phone number and hours you operate your BBS?

Phone: ______________ Hours: ____________

Do you maintain a software library? yes________ no ________ (If your answer is "yes" could you please send me a directory of the programs you have in your library?)

Please indicate by an "X" the type of computers your organization supports and the number of particular computers within your organization.

	COMPUTER	NO. OF COMPUTERS
2001	________	________
4016/32	________	________
8032/96	________	________
SuperPET	________	________
B128/256	________	________
BX256	________	________
VIC 20	________	________
C-64	________	________
SX-64	________	________
PET 64	________	________
264/364	________	________
Other: Make________	Model________	________

Please indicate by an "X" the SIG's (Special Interest Groups) and the number of members participating in the SIG's within your organization.

	X	NO. OF MEMBERS
BASIC (programming)	________	________
Machine Language	________	________
CP/M	________	________
FORTRAN	________	________
COBOL	________	________
Pascal	________	________
LOGO	________	________
Pilot	________	________
Simon's BASIC	________	________
Comal	________	________
Graphics (programming)	________	________
Music & Sound	________	________
Other	________	________

We would appreciate any comments you may have. Please attach a separate sheet to this form.

Return Questionnaire and any other information to:
Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
Attn: Pete Baczor

Membership Application

(Cut out and copy, or just use this as an aid in designing your own application.)

Name: ____________________

Address: ____________________

City: ____________ State: ______ Zip: ______

Phone: Home (____)-____-____

Work (____)-____-____

Occupation: ____________________

1. Please list what type of hardware you presently own.

	MAKE	MODEL
Computer		
Disk Drive		
Printer		
Cassette		
Monitor		
Modem		
Other		

2. In column A indicate why you bought your computer. In column B please indicate what the computer is being used for.

	COLUMN A	COLUMN B
a. Programming		
b. Business		
c. Education		
d. Recreation/Games		
e. Other (please specify)		

3. Please check the category which best describes your knowledge of computers and computer programming.

________ beginner/novice

________ intermediate

________ advanced

________ expert

4. In column A rank the selected software groups according to your level of interest in them. In column B indicate which percentage most accurately represents the presence of that software in your collection. Use a scale of 1 through 10, with 10 being the highest.

	COLUMN A	COLUMN B
Business		
Communications		
Educational		
Engineering Aids		
Games		
Graphics		
Languages		
Music/Sound		
Technical Aids		
Utilities		

5. We offer different types of memberships. Please check which type you prefer to join under.

a. Standard ________

b. Student ________

c. Sr. citizen ________

d. Family ________

e. Affiliate ________

f. Honorary ________

6. Why do you want to join a computer users' group?

____

____

____

____

____

____

____

For Office Use Only

Accepted: yes____ no____ Date: ____________

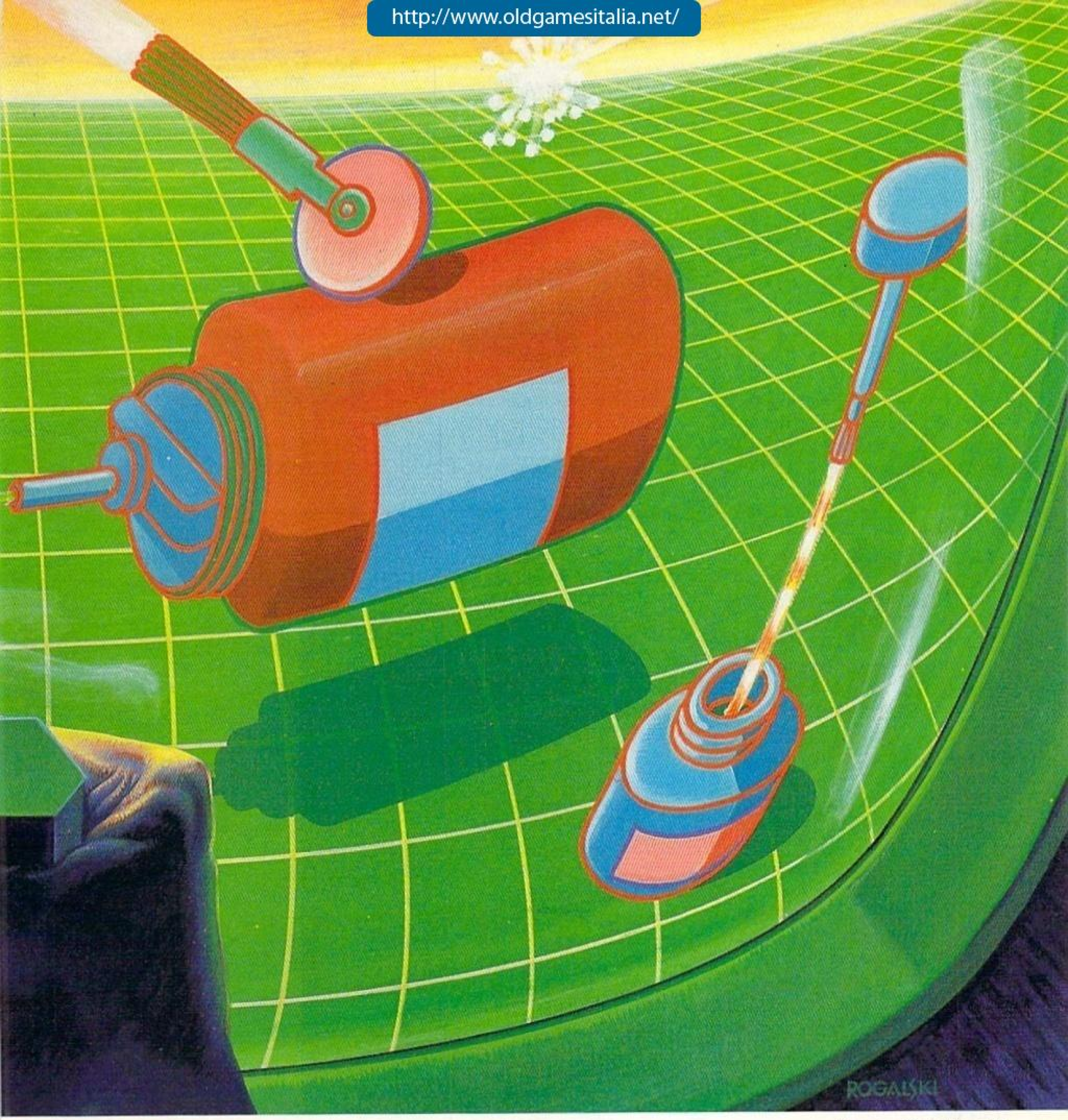
Membership Number: ____________

True Confessions of a User Group Newsletter Editor or Byting the Bullet Without Really Trying

By Walt Lounsbery Wichita Commodore User Group

A newsletter can be the glue that holds a user group together. Here's how to keep the newsletter's editor from coming unglued.

Every now and then, since assuming the duty of editor for the Commodore Users Group of Wichita's newsletter, I have reflected on the role that the newsletter plays in our club. I think about it late at night, usually, when the newsletter is not coming together on schedule, and a



Illustrator—Michael Rogalski

few more hours of work could make all the difference.

It seems obvious that the members can and will trade programs and ideas on their own, regardless of the club. (For example, how many fellow Commodore owners do you know at work or in your neighborhood? Are many of them in a club?) And despite all the effort of those trying to save money by buying things in quantity, they often end up getting much better service and value through the local dealers or even by regular mail order. Like most organizations, only one-fourth of the members really make it to the meetings, and the ones that want to attend a workshop always seem to miss it.

As a result, it seems as if the newsletter is the glue that binds the whole organization together. It is where the members really find out what is going on. The newsletter provides entertainment, education and communication. Certainly it is worth that extra ounce of effort to produce a newsletter that hundreds of people have been impatiently waiting for?

Nowadays, I ponder all these things for a few seconds, roll over and fall into a deep and restful slumber.

Newsletter Phobia

Having made my cruel point, perhaps it would be best to state it another way before my club arranges a lynching party! (These are quite popular in Kansas, even more than Tupperware parties.) Although a newsletter can be an essential part of any club's activities, there is an almost universal fear of writing and publishing something so simple. The job is seemingly so awesome that many clubs don't have newsletters, although they would dearly like to put out one. I have seen people that worked on high school newspapers cringe at the very idea of writing for the club newsletter, much less trying to produce one. But sadly, the lack of a newsletter often means the death of a fledgling club. This is hard for me to understand because a computer club should be fun and working on computer club projects should be even more fun and rewarding. It is a matter of attitude, of philosophy, if you will. Every computer club officer should keep in mind Lynd's Law: Life is worth living, but only if we avoid the amusements of grown-up people.

You Must Put In What You Put Out

Perhaps the best way to start a newsletter for a computer club is simply to start one. Make it a single page to begin with. Add pages as people start to contribute and before long there will be plenty of food for thought in every issue. Keep in mind that every club is unique and the newsletter should reflect the nature of the club, not of its editor. This is how the best newsletters start and grow.

But if the editor does not shape the newsletter, what the heck does the editor do? What we have here is a chicken-or-the-egg situation. The newsletter obviously does not assemble itself out of everyone's ideas. The editor must decide how to put the articles together, what news might be worth including in an issue and how to get the newsletter to the members. In the beginning, the dedicated editor may even have to write most of the articles.

I am going to offer some suggestions that should help in publishing a newsletter. It is possible to put out an interesting gazette without a lot of effort. On the other hand, the most difficult part is really what to put into those issues from all the material at your disposal.

A Newsletter Is Like A Salad: All Tossed Together At The Last Minute!

Even though starting a newsletter can be nervewracking, the first issue can be incredibly easy to assemble. It should have the bare minimum club news, such as the meeting schedule, a map of the meeting location, minutes of the previous meeting and the names of the club officers and how they may be contacted. Now that the contents of the first page are determined, the second page should include any pleas for newsletter articles and participation in future club activities. This will take about one sheet of paper if printed on both sides of the sheet. There should only be one more sheet of paper as a cover sheet, with a return address printed at the appropriate spot. The third and last sheet is the most important for you, it should be a stamped, self-addressed questionnaire for the club members. Although this costs a bit of money, it is well worth finding out what kinds of computers the members have and what their interests are. With this information in hand, it is possible to determine the best content for the following newsletters.

OK, so once you have achieved one issue's respite with the old membership questionnaire trick, what do you do now? It is necessary to start on the next issue just as the last goes out, and editing that next newsletter really shouldn't be a chore. After the first issue, you, the editor, must use all the cunning at your disposal. You have to remember Peter's Proposal: Anything worth doing is worth getting someone else to do.

Peter's Proposal operates in this manner. Every club should have several officers, each of whom may have something to say in each and every issue of the newsletter. The president is always wanting more help with meeting programs, tutorials and workshops. The secretary has to publish the minutes. The librarians are always pleading for more programs. The membership chairperson has to flaunt a long list of the people that joined the club last month. The treasurer is obligated to point out that the club is losing money. In fact, as editor you may have difficulty getting them to shut up!

There is also the small matter of the club membership and that survey you sent out. Even though the officers were elected by the majority of the club, they are just a small minority taking up lots of expensive paper in a newsletter. An editor must try to defy the precepts of Kitman's Law: Pure drivel tends to drive ordinary drivel off the TV screen.

Until the members get over an initial reluctance to write for the newsletter, it is usually necessary to provide good examples. This also helps prove to the other officers that they aren't writing all the newsletter! Before I discuss sources of material, consider Table 1, a typical list of items in a newsletter. Certainly there is no minimum number of these in a good newsletter, just as there are many more possibilities not listed here.

Table 1
Computer Club Newsletter Items

- Club Officer Names and Telephone Numbers
- Table of Contents
- Club Officer's Messages:
  - President's Page
  - Librarian's Letter
  - New Members
  - Treasurer's Report
  - Minutes of the Last Meeting
- Meeting Schedule
- Meeting Map
- Program Library Access
- News and Rumors
- New Products
- Club Classified
- Product Reviews
- How To Do It (Tutorial)
- Program of the Month
- Hardware Construction
- Modem Talk
- Cartoons

The Great Paper Chase

I have always believed that a club newsletter should consist of articles written by the members. Sometimes, though, all those articles that were supposed to arrive before the deadline, don't. Every now and then a new development just has to be in the next newsletter. The first few issues, of course, should contain some articles of interest until the local articles are written. Where does this material come from?

One of the best places to start looking for newsletter material is the magazine you are reading right now. Try contacting some of the other user groups around the country, listed elsewhere, and you can get examples of some of the best newsletters. Generally, it is good manners to return the favor and place those clubs on your mailing list. Besides providing articles and gossip, they will show many creative formats for a club newsletter. Computer bulletin boards and teletext services also provide a good source for up-to-date material. The magazine itself, of course, will have some of the latest news that may bear repeating. If you are industrious, it is worthwhile to scan several magazines and trade journals for that interesting tidbit. I regularly look at about thirty publications a month, which is just a fraction of what is available.

Don't forget to send Commodore your club's name and address! This will be published in *Power/Play* and *Commodore Microcomputers*, showing the world that a new active users group has been formed. Several third party manufacturers mail to this list, so your club will also eventually be sent a lot of new product announcement literature.

One of the astounding things about editing a computer club newsletter is how easy it is to get review material. New programs and hardware are being produced so fast that many dealers cannot possibly keep up. Most dealers will appreciate the opportunity to work with the local user group and to hear exactly what their customers think of a product, so it should be fairly easy to borrow evaluation samples. Make sure to give proper credit to the dealers in your newsletter; this is one way they are supporting your club. And, naturally, some care is required in recruiting people to do the reviews!

The Nitty Gritty Newsletter Band

Once the sources of material have been located and tapped, the newsletter editor must face up to the really difficult decisions. It is necessary to collect the articles, lay out the newsletter format, perhaps make up a mailing list, get the newsletter printed and send it out. After the first few issues it is easy to see that the writing and article solicitation is the fun part; getting the issues out can easily become a chore. But it is possible to nearly eliminate that tedium and still produce something your club can be proud of.

Format, Printing and All That Jazz

When it comes time to put together a publication and send it out, no matter what it is, there is one thing that should be foremost in the editor's mind. MONEY!!! Yes, it sounds petty, even cheap. Certainly the editor should be concerned about quality, good layout and content. But think about this: the newsletter can be the single greatest expense for a club. Finding some way to save a penny here or there means both lower dues and more funds to purchase needed equipment and supplies or maintain a club computerized bulletin board. In the case of our user group, the dues are set entirely on the cost of producing a newsletter, estimated at $1.25 per member per issue, or $15 per year if we can produce 12 issues. Of course the actual cost can vary a lot, as we shall see.

There are several ways a newsletter can be laid out. The simplest format is very easy. Simply set the margins to three-fourths inch (7 characters at 10 cpi) on the left and one-half inch

on the right (5 characters), and provide enough margin at top and bottom to allow for misalignment during the copy process (one-half inch). A standard 8½ by 11 inch sheet of paper should be used. To make the process easier, the items should be typed or printed out separately, and then pasted up on the final sheet. "Paste" is a generic term. The articles can be attached to the final page with "magic" transparent tape, rubber cement, special layout glue sticks or wax, if you have access to a waxing machine. (Those of you with access to professional typesetting services that provide camera-ready copy on an adhesive backing may not need the advice in this article anyway!)

The easiest method for an editor is wax, which the printer despises. Rubber cement is unhealthy and your thinking tends to get distorted just when you need it the most. Tape is a one-time operation that requires a sharp knife if you make a mistake. It is best to try all the methods to find what you can get along with. After paste-up, it is essential to apply page numbers for easy reference during printing and collation.

Now isn't that simple? Not if you are a penny-pincher! First, it is wasteful of paper. Second, if you are concerned with providing copy that is easy to read, the long line lengths just won't do. The first improvement is to print on both sides of the paper. This requires laying out pages so that one edge can be punched for notebooks (the wide margin). Half the layout pages will have the wide margin on the left side, the rest will have it on the right side. Since the printer will copy both sides, you should use a separate layout sheet for each page in case of mistakes. Carrying things to great extremes, it is possible to use a size-reduction step before the final copy. This allows putting four pages of full-sized printing on a single sheet of 8½ by 11 inch paper, with the lines aligned along the length of the paper and two printed pages side-by-side. However, this process requires at least letter-quality printing with a good quality copying process. It also makes your job a lot more difficult, since pages and sheets of paper no longer coincide. Numbering the pages isn't easy, and the printer will really get a headache collating and stapling the thing. However, this is exactly how many magazines (including the old *Power/Play*) are assembled. With the reduction step, it is possible to actually put the equivalent of five pages on a single sheet of paper, since the layout page can be thirteen inches long.

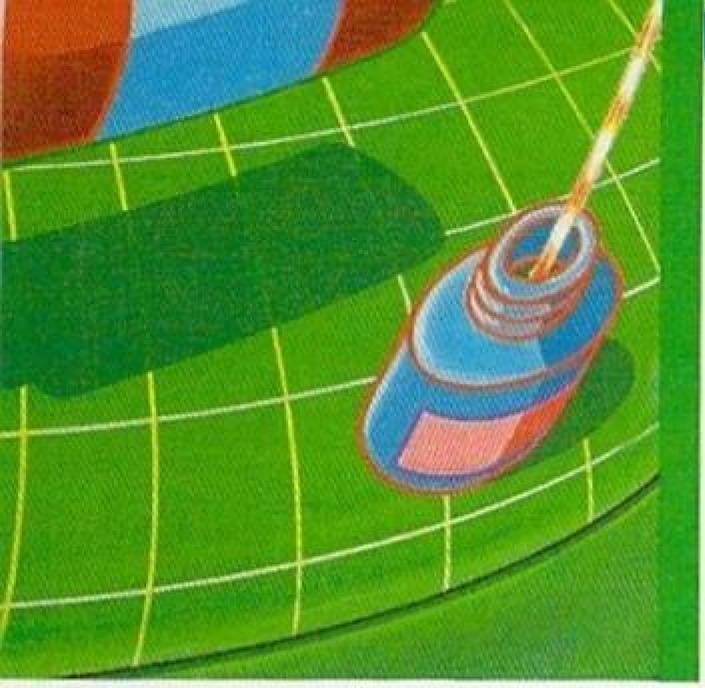
Photo-reduction is great if paper is expensive, or you send all your newsletters airmail, but what if your main concern is legible issues? In our group, we found that far too many people simply couldn't see that kind of print. (I won't say that this had anything to do with age. They might club me to death with their canes.) Also, program listings cannot be reduced well at all.

If you are mainly concerned with legible copy, line length must be dealt with. The reason that newspapers are printed in narrow little columns is that narrow columns make it easier to read that tiny print and it is easier to lay out the pages. We can take the same principles to heart and put multiple columns on a page. If the standard page size is used, two columns are practical. If the page is laid out sideways or on larger paper, then three columns may be used. In any case, make sure about three-eighths inch separates the columns. One drawback to columns is the use of right-justification with word processors. Unless you use a word processor with a very sophisticated word-split capability, the columns will end up with large gaps as the word processor tries to align the words.

Before we move on I should mention printing costs. This varies a lot from area to area. Some clubs even have sponsors willing to donate printing. If you must go to a printer, be sure and send out a request for bids to several printers to obtain the best rate. The request should tell how many issues you will be printing, how many pages per issue, what type of printing process and if you anticipate much growth in circulation. Don't forget any stapling or collating requirements.

Old Artists Never Die, They Just Paint Themselves Into A Corner!

Of course, this is a fate that an editor avoids each and every issue. A good part of this is because the editor adapts the artist's tools for the sake of good text presentation, entertainment, but above all, to get rid of those unsightly gaps between the articles. Sometimes the filler material can overwhelm a newsletter, but it is essential for a pleasing appearance. I cannot really do justice



here to all the many ways to apply graphics to newsletters. Instead, I suggest looking at magazines and other newsletters to get some ideas.

Probably the best source for graphic material is the transfer sheets available in office supply stores. These dry transfer sheets have interesting letter styles for titles, short items and page numbers. Some have oddball items like mathematical symbols, pointing hands or border graphics. If you have a hard time drawing uniform lines where needed and you don't feel like purchasing an expensive drafting pen set, adhesive pin striping may be applied. If your newsletter circulation is sizable, it is possible to purchase computer cartoons for use. Many cartoonists will send sample material out to clubs listed in this magazine.

Roundup At The OK Post Office

Everyone knows how to mail things, but how many mail bulk? Among the many ways an editor can save money, the main consideration is always postage costs. Say your issue is firming out to sixteen pages or eight sheets of paper copied both sides. This will weigh about an ounce. Current first-class postal rates dictate that each newsletter must have a 20-cent stamp. You may need an additional 17-cent stamp to take care of the extra weight of staples. So the postage costs are often greater than the printing costs. And soon the primary ounce rate may increase to 25 cents, making the disparity worse.

This kind of postage might be called a ''small tax''. It is obviously prohibitive to publish a newsletter containing more than seven sheets of paper. Also, the cheaper bulk rates (presently 11¢ for up to about 3½ ounces) are available only if your circulation is 200 or more. This is one of the advantages of having a large club, you see!

Once a newsletter's circulation approaches 100 per issue, it is necessary to consider bulk mail. Even if you have to mail free copies to dealers and extra copies to yourself, the breaks may be in your favor. With bulk mail the rate structure becomes much better. The basic piece rate of 11¢ per 3½ ounces is totally adequate for even the largest newsletters. All the muss and fuss of pasting postage stamps is traded for the fun of zip sorting your mail. This is really no chore if your mailing list is computerized, and we know there is no excuse for that, right? The post office will supply a permit number for forty dollars a year, one of the true bargains they offer. By the way, if you can prove your club is a nonprofit group (no small job), your bulk mail cost is half the going rate, which, for a large group may make the cost of incorporating as a nonprofit corporation worth the investment.

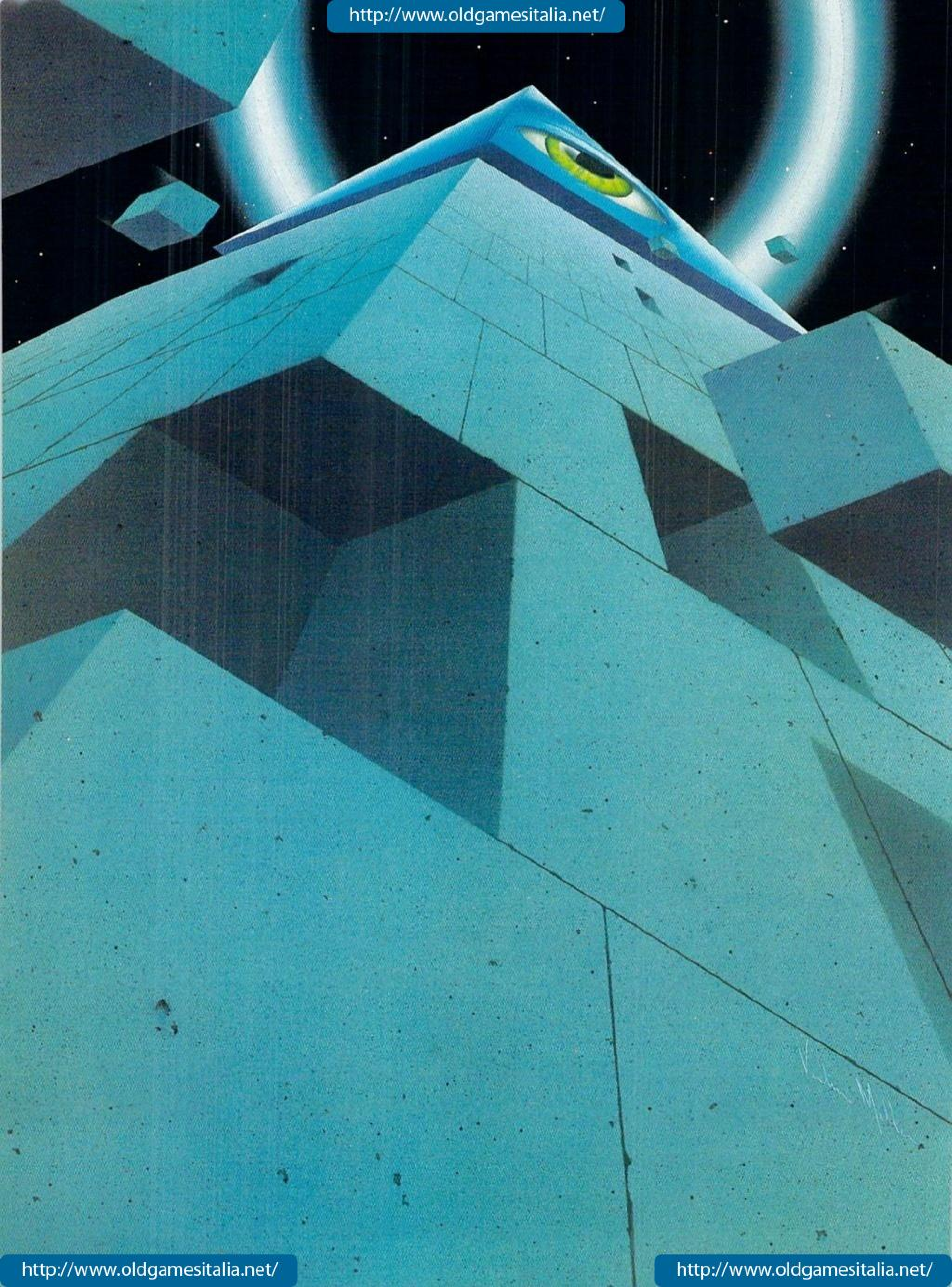
Any Sufficiently Advanced Technology Is Indistinguishable From Magic

Oh yes, all of this article collecting, editing, printing and mailing is supposed to be easy. Almost like magic (ahem!). A computer club can turn on the magic like no other, for computers are the name of the game. With a reasonable collection of word processors at your disposal, it is easy for a member to write an article to go directly into your newsletter format. Spelling checkers and utilities can help find errors and perform the newsletter layout. Items can go directly from a computerized bulletin board into the next issue. Mailing list programs can help keep a current list of members and subscribers, sorting and printing mail labels and reports.

As I mentioned before, there is only one tough job a newsletter editor has: deciding the organization of an issue. Sometimes the content must also be judged. There will be some demand for commercial advertising, so rates will have to be set (I recommend adding 30% to your cost of publishing a newsletter in six months. This prevents subsidizing the ads). How many reviews are too many? Is quantity better than quality? Should each issue have a program listing or two? Whose article gets put on page one? Should circulation be promoted, even if it means stepping on the membership chairperson's toes?

In this case, there is one good lesson we can learn from video games. It's not fun unless it is a challenge. Editing a newsletter is fun. It's a service to the club and to the computer community. It raises the low and entertains the mighty. Progress marches on. Newsletters instill confidence and good manners. Above all, like this article right here, they totally conform to Feuchtwanger's Law: There's only one step from the sublime to the ridiculous, but there's no road leading back from the ridiculous to the sublime. AMEN. C

Walt Lounsbery



An attorney explains the advantages and disadvantages, in's and out's, of incorporating your group as a nonprofit corporation.

By Herbert Swartz

Incorporating A User Group

A nonprofit corporation for user groups? Why not... Nonprofit entities today, those organized as corporations, are as numerous as traditional profit corporations and run the gamut from churches to hospitals, foundations to condominiums, fraternal clubs to labor unions.

Actually, a user group as a corporation fulfills two well known and longstanding American predilections. We are a nation of "joiners"—no other nation in the world even approaches the United States in number and activity of nonprofit organizations. It seems that, although for carrying on an activity, for profit or otherwise, the individual proprietorship and the partnership may be nice, Americans traditionally turn to the corporation.

What then lies behind the legal jargon, the myths, and the sophistries of this creature called "the nonprofit corporation"? Nothing very complicated, really.

Corporations as a whole—whether for profit or not—are the offspring of state law, not federal; and the law of each of the 50 states provides for both kinds of corporations. But be not afraid. Though we are talking 100 varieties of corporations, the distinctions among profit corporations, among nonprofit corporations, and between the two groups, are more of form than of substance. The underlying principles of corporate law are across-the-board.

For example, the first step—incorporating. Deciding to establish any corporation, some will opt for a trip to the lawyer's office; others will call the corporate division of the local secretary of state and start the process themselves;

Illustrator—[illegible]

Incorp

while a third coterie will decide to employ one of the several companies (many of them located in Wilmington, Delaware) that sell incorporation services. Regardless of the route chosen, though, the process is the same.

All corporations begin with a "purpose"—to run a hardware store (profit); to aid cancer research (nonprofit). And they are similar in that the goal is to earn money to support the "purpose".

Only then do the distinctions begin. The earnings of the profit corporation must be distributed to the shareholders, directors and officers; the earnings of the not-for-profit must all be expended for the "purpose"—assumed to be benevolent—and no distributions or dividends of any nature are permitted to the members (in effect the shareholders of the not-for-profit), directors and officers. The only payments permitted to these people by a nonprofit corporation are reasonable salaries and reimbursement of expenses.

It is this distinction—the lack of distribution of profits—that allows the nonprofit corporation to apply to the Internal Revenue Service for a tax exemption: permission to have its earnings exempted from income taxes—that is, those earnings connected with the corporation's purpose. The IRS offers more than 20 groupings of exemptions for which a not-for-profit may apply. Even though a state nonprofit charter has been granted, the IRS will still not automatically provide an exemption. But with such a state charter, getting IRS approval borders on the routine.

One IRS classification—the charitable exemption—is especially desirable. Not all nonprofit corporations are charitable corporations, of course—the labor union, say—but all charitable corporations are not-for-profit. And not all states divide their not-for-profit grouping into charitable and noncharitable categories. In any event, state classification as a charitable corporation will not bind the IRS. Yet for computer user groups or others incorporating for nonprofit status, the opportunity remains the same: Try to secure state charitable status and then apply for the IRS charitable exemption. For with it, all contributions to the corporation are deductible as charitable contributions by the donors. The key, thus, is the "purpose"—convincing the IRS that what the nonprofit corporation is about, what is spelled out in the few sentences or few paragraphs of the corporation's purpose, is not just not-for-profit but charitable as well.

Federal income tax considerations aside, the similarities for all corporations extend further to the articles of incorporation. These are filed with the local secretary of state on prescribed forms, setting forth the required data and purpose of the corporation. The distinction with a nonprofit is twofold.

First, such a corporation pledges its benevolent nature and purpose, disclaims profits for individuals and promises not to sell stock. And second, and in the event that the corporation's activities are ever concluded (all corporations have perpetual existence unless they choose otherwise), that after payment of outstanding expenses corporate assets will be distributed to other organizations pledged to benevolent purposes.

Other documents—beyond the articles of incorporation—are also similar for both profit and nonprofit corporations. So bylaws must be prepared, though not filed with the secretary of state (but filed with the IRS in pursuance of the exemption, charitable or otherwise). And a corporate name, agent and headquarters have to be selected and filed with the state. All of these documents can be changed subject to various votes at a later date, and for those filed with the state in the first place forms are readily available for notifying the

rating

state of the changes.

In short, that information which the state requires to be filed is a constant and updated public record—a part of the incorporation privilege granted by the state, although that information contained in the bylaws or not required by the state—for example, the list of a corporation's stockholders, the members of a nonprofit corporation—continues as a private, undisclosed record.

It can be assumed that those nonprofit organizations deciding to incorporate are aware of the advantages to incorporation—and a number of others as well. Nonprofits can own property, free from state and local property taxes; their earnings are not subject to state and local revenue raising. Further, they are permitted as duly chartered nonprofit corporations to solicit funds from the public for the corporation's purposes. Their postage rates are frequently lower; they are exempt from federal and state labor rules, and import and custom duties. Especially for those nonprofits deemed charitable corporations, many states provide exemption from tort liability or a limitation on the amount of damages that can be assessed.

As for still other advantages—or reasons why a nonprofit organization might well incorporate—they are again those that the businessman finds available. Once created, a corporation exists separate and apart from those who have created it. The corporation is an artificial person, but a person according to the Constitution, nonetheless. Those rights and powers granted to a natural person by the Constitution apply.

So the nonprofit corporation—as with the business corporation—can carry on whatever activity it chooses as long as that is the activity outlined in its charter. It can conduct such activity across state lines, borrow money, enter into contracts, own real and personal property, grant mortgages. It can hire and fire employees, join other associations or even corporations. It can sue and be sued—the latter subject to state tort limitations.

A legal person, the corporation is liable for debts and judgments—but only to the extent of its assets. Managers and directors, shareholders of business corporations and members of nonprofits are not liable for their actions in behalf of the corporation. Limited liability is the order of the day, and it begins and continues from the time incorporators get together to form the corporation.

As for the few exceptions, they are again across-the-board. A corporation cannot be used as an excuse for criminal activity. Directors and officers may not be liable to third parties, but they do owe the corporation itself a fiduciary duty. They can be sued by the corporation for failing to carry out that duty—for instance, mingling their own assets with those of the corporation, or putting their own interests ahead of the corporation's interests. And those individuals charged by the corporation with filing certain state or federal financial disclosures can be held liable by the government for noncompliance.

Perhaps most important for user groups—or any nonprofit organizations considering incorporation—corporations have a continuous existence. Key people may come and go, but the corporation continues on. It is not subject to whim or the death of individuals. Conversely, when a corporation's purpose is over, all that is necessary to end the corporation is a simple vote of members—those who make up the corporation through the grant of membership certificates as distinguished from those who compose a business corporation through the selling of stock (and who could similarly vote dissolution).

True, those who work for a nonprofit cannot participate in profits as with a business corporation, but all other commercial

A User

rewards are the same. A nonprofit can have fringe benefits for employees—pension and retirement plans, medical benefits—and pay reasonable salaries. At worst, employees can expect far more from a nonprofit corporation than from an unincorporated group.

As for the disadvantages of incorporating—and particularly with a user group—many appear to be, as with any business organization, matters of form not substance. However, they surely have to be considered.

To begin with, incorporating does cost money—at least a couple of hundred dollars in local and state fees. Then, of course, come lawyers and accountants. To go it alone, to incorporate without them, is a risk at best. To seek a charitable IRS exemption without them—or to run a large nonprofit corporation without their aid—borders on the foolhardy.

Then there is the matter of records and paper. For the unincorporated, these can be kept at a minimum. Not so once the choice is made to incorporate. Records and paper are generated, often in the extreme—and they do cost money regardless of how small or large the corporation becomes. This is only natural. The corporation is a creature of one of the 50 states, a natural person under the Constitution. State and federal governments demand paperwork from their citizens—a grouping that does not include the unincorporated association. Freedom from taxation, the right to raise funds—these are activities for which government's grant and the flow of paper are synonymous.

Another major disadvantage, depending on how you look at it, is the loss of personal control. One or more people in an unincorporated association can do as they wish. But corporations are controlled by directors who appoint the officers of the corporation to exercise the day-to-day control. These can easily not be the people who started the organization in the first place. Certainly they will not be the eventual membership as a whole, which exercises ultimate control. In other words, an unincorporated association can ignore the will of membership; a nonprofit corporation cannot.

So a corporation, as distinguished from an unincorporated group, would appear to have less operating flexibility. Votes of directors and/or members are necessary to change documents on file with the state—or the bylaws. Yet perhaps this is a contention more on the surface than real. Votes of directors can be accomplished by telephone in many cases; no formal meetings are necessary. And standard forms from the secretary of state for the requisite recording and filing can be readily at hand.

Much more real, it would seem, is the argument that incorporation opens the group up to public scrutiny—by the government as well as by third parties. The act of incorporating does mean the loss of some confidentiality. Indeed, in some cases—Massachusetts is a prime example—nonprofit corporations are actually under the jurisdiction of the state attorney general. Far more detailed financial and operational reports are required than for business corporations—a long way from the freedom from scrutiny an unincorporated association has in such states.

Finally, no discussion of incorporation in this country would be complete without turning one's gaze toward Delaware. As is well known and documented among businessmen—from General Motors to the corner variety store—incorporation means that state. That is because, ostensibly, the Delaware code for incorporation places the rights of director, manager and officer ahead of those of stockholder and creditor. Far be it from us to pass judgment. Rather, our only duty is to

Group

expound that, for the nonprofit corporation, the weather is no better in Delaware than anywhere else in the country.

Delaware's nonprofit rules are not separate; they are part and parcel of the state's General Corporation Law. The same forms as for business corporations are used. Everything is easy and streamlined. Delaware wants business corporations; it wants nonprofit corporations also.

Some states require a minimum capital requirement—a few as high as a $1,000. Delaware requires none. One person can be the board of directors, the president, treasurer and secretary and the corporate organizer as well. In other states the minimum to establish a corporation and run it is three. Delaware thus allows one-person corporate formation and operation, and this is far from the general rule.

The state's judicial system has a special tribunal for corporations; other states do not. This makes judicial decisions fairly predictable, something corporate litigators do not find elsewhere. Needless to add, that predictability leans toward management.

Too, corporations are not subject to tax in Delaware if they are formed there but don't do business there—which is fine for nonprofits as well, since nothing requires a Delaware corporation to do business in the state. And though nonprofits might pay license or franchise taxes in other states where they are incorporated, not so in Delaware.

Even in this day and age, a person can do business in Delaware through a corporation and retain anonymity—perhaps a more important feature for business ventures, but still something that could well appeal to the nonprofit sector. Indeed, it is possible for him to establish the corporation entirely by mail, never even coming into the state. Meetings need not be held in-state; in fact, directors can act by unanimous consent in lieu of formal meetings.

A Delaware nonprofit corporation can own stocks and bonds issued by business corporations, real and personal property anywhere—all without any limitation. And the Board of Directors of a not-for-profit—which could be one person, thank you—can alter the by-laws of the corporation without a vote of the members.

To accomplish all this, the nonprofit need not do business in Delaware, nor even have so much as an office in the state. It simply needs a Delaware registered agent—which task any number of companies are in business to perform.

Any out-of-state corporation—for example incorporated in Delaware and doing business in New York—is called a "foreign" corporation. It is free to do business in the new state provided it registers to do so; that reciprocity runs with the ability of a corporation to do business anywhere in the country even though chartered in only one state. And as may be assumed, registration entails far less than incorporation—and this opportunity is as much available to nonprofit corporations as for-profit corporations.

Today, no one can say for certain the number of nonprofit corporations—too many states do not keep exact records. At minimum there are thousands, perhaps hundreds of thousands. Their valuable place in our society is assured. The place for computer user groups in that universe of nonprofit corporations is wide open. C

Herbert Swartz is an attorney who lives and works in New York City.

One of the original members of one of the original Commodore user groups, Jim Butterfield has become internationally recognized as an expert in every phase of microcomputing. He writes extensively for computer magazines, is in great demand all over the world as a lecturer, has served as an advisor for television productions concerning micros and has created computer training video tapes—just to name a few of his accomplishments over the last several years. Yet he is still, in many ways, just a devoted Commodore user who lives in Toronto and participates in his local user group, TPUG—which happens to have become the largest Commodore user group in the world.

Jim Butterfield:

Commodore User Par Excellence

By Gail Hook

The first words a Commodore owner learns after LOAD and RUN are "Jim Butterfield". It's a name to conjure with for computer enthusiasts from expert to absolute beginner. Butterfield has no patience with the "I'm too full of knowledge to get down to your level" school of thought. As he explains, "When you say 'this is very complex', you're really saying 'I don't know how it works'. If a program works, it works by a series of simple interlocking related things. Ultimately, the computer does what it does because it has no choice—the program is in control. As soon as we accept that the machine is not doing a random thing, then every problem has to be solvable."

From his home near downtown Toronto, where he lives with his wife Vicki and their family of cats, Butterfield reaches out through many media to solve problems and provide information for microcomputer owners. Because he is interested in ensuring that essential facts be distributed to anyone who needs them, he makes sure that many of his articles appear first in public domain magazines (e.g., *The Transactor*) and newsletters such as *The Torpet.* "Such things as memory maps I hesitate to put into public magazines lest they become private property," Jim asserts.

Readers of most Commodore-oriented magazines will be familiar with his informal, witty writing style, which Butterfield says developed because, "I try to write it as I would say it. I do a lot of presenting material to both kids and adults and I try to keep the same style in my writing. Also, whenever I can I slip in a simple example program. Then even if readers can't understand what I mean they can run the programs, which are constructed to prove the same point I'm trying to get at with narrative".

The popular TV Ontario show "Bits and Bytes", which was aired in the U.S. on PBS this winter, owes much of its success to Butterfield's sound technical advice and talent for reducing computer jargon to everyday images. He wrote the script and most of the support literature for the series. Another educational experiment took place in the summer of 1983 when Butterfield made a 90-minute video tape—an introduction to the Commodore 64. He has heard rumors that Commodore Canada is negotiating an agreement with a video tape company to produce and distribute the tape in Canada. Jim laughs, "It might even become a commercial success, although I don't believe I'll outsell Jane Fonda."

Butterfield is always a hit when he speaks at a Toronto PET Users Group meeting, gives a course or attends a conference because he is at ease, friendly and knowledgeable. Jim finds these appearances useful because "they are a very good way of getting im-

mediate feedback from people." He adds, "I'm frequently invited to Commodore fests of various sorts, which are great fun. This has given me a considerable opportunity to travel." Butterfield regularly attends the PET Show held each June in London and was asked by Commodore to introduce the Commodore 264 in Las Vegas this past January.

Thinking of venturing into machine language programming? Look for Butterfield's latest project—a book about machine language for beginners. Tentatively called *An Introduction to Commodore Machine Language Programming,* the book should appear in June from the Robert Brady Company.

When it comes to machine language, Butterfield is certainly no beginner. "Back in 1964 I worked for a year as a programmer on a Collins C8401," he explains. "We had to do most everything in machine language. A little over ten years later I decided to find out what this 'micro stuff' was all about, so I started watching the current magazines. I settled on a completely pre-built machine called the Kim 1, which had a 6502 microchip in it. That turned out to be a return to the past. Everything we had been doing a dozen years before on the large million and half-dollar computer we were doing once again on this little $250.00 board."

The Kim 1 was the beginning of an absorbing hobby for him. He had no real plans to earn his living as a freelance computer expert. That came about, Butterfield remembers, "almost purely by accident. I worked for CN/CP Telecommunications for 24 and a half years. I quit in February, 1981, because the company decided to move substantially away from the center of Toronto. I was faced with a considerable amount of commuting time that would make it impossible for me to continue with my hobby. When faced with that choice I really had no choice and I quit."

Butterfield is enthusiastic about his "hobby". He says, "There's a curiosity and sense of delight that the machine doing your accounts receivable or keeping track of inventory can be turned around to do something totally entertaining."

He finds programming a creative activity because it forces you to bring together a number of skills to solve a particular puzzle. "It's like a chess game. You know that if you lose a chess game, the blame only goes one place; and if you can't get a program to work, you know the reason is that you haven't yet risen to the task. That just becomes irresistible! That's when you start staying up all night saying 'I've got to make this thing work!'"

Programmers who use any of Butterfield's programs will attest to his ability to make them work. Some of his most famous are "Copy-All," and "Adventure" (which he adapted for the PET). Canadian PET owners rely on Jim to come up with an updated income-tax program every spring. *SpellPro* (from pro-Line Software, Mississauga, Ontario), a spelling checker to accompany *WordPro* is one of the few Butterfield programs money can buy.

Why doesn't Jim usually market his software? For two reasons. First, he says, "Most of my software is simple, illustrative stuff. I would like to foster an environment where people pass out their software with reasonable generosity. I think that by setting a good example I might sort of lead the way in that. I can't say that I'm terribly happy when I hear someone say, 'What do you have to trade for this program?' I would rather say, 'Take this program and remember me when you have something to give.' When I give away a program I don't lose anything—I still have everything I had before. I usually put it on the TPUG disk because that keeps me from having to answer a lot of requests for it."

Butterfield's second reason is summed up by his response when someone complains about one of his programs. He answers, "Fine. I'll give you your money back." He states, "When you take money for something, it's my belief that you acquire an obligation. The idea that you can sell a program and buyers will walk out the door and you will never see them again has the potential for trouble. I think that most people who put down money for software feel they are not buying a disk or cassette tape, but that they are buying a service."

He adds that professional calibre programs such as *WordPro* or *VisiCalc* represent something the ordinary programmer could never attempt and people should recognize their worth and be willing to pay to use them. "If I see a program doing a worthwhile thing and it's too much trouble to write it myself, why on earth wouldn't I save myself the trouble and buy a copy? We have a perception problem. We grab a copy of a program, and because the original person still has his copy we feel that we haven't stolen anything from him. Maybe it isn't theft—what do you call it when a person sneaks into a movie theater? Whatever it is, it's dishonest—it's cheating."

The question of whether computer coding is protected under present copyright legislation is still very much up in the air in both Canada and the United States. Butterfield, however, has made up his mind. "I believe very strongly that any person writing an original program has the right to do as he chooses with that program. If he chooses to sell it—if he chooses to request that it not be copied except for a fee—then he has absolutely that right. I will support that."

Jim does have reservations, however, about programs which are "protected, sealed, uncopyable or unlistable, because the user then becomes victim of whatever it is the program does. If he is lucky, it will do the right thing. If it doesn't then he can plead with the manufacturer but he's not allowed to fix it himself because the tools to do so are locked out." Butterfield cautions, "I personally would be very leery of a program I could not examine."

Besides deciphering many of the mysteries of the 6502, Butterfield has given thought to the social implications of microcomputers. In 1984, while Big Brother might be lurking in huge government databanks it is Little Brother who has captured our attention. Far from turning us into a nation of people isolated from each other, micros have fostered what Jim calls "almost an explosion in terms of user community of interest. You suddenly have this amazing thing which is multiplied many times over in the Commodore lines—and that is people building a social life around microcomputers."

He adds, "I think that a lot of people who don't know about computers have this vision of the mad scientist sitting in a corner with his machine. As you know, of course, nothing could be farther from the truth. People want to exchange notes, brag a little, say 'Look what I did,' or ask 'How can I make the machine do this?' I'd seen this kind of interface, this communication, in commercial programming but I was amazed by how it grew and took hold around micros."

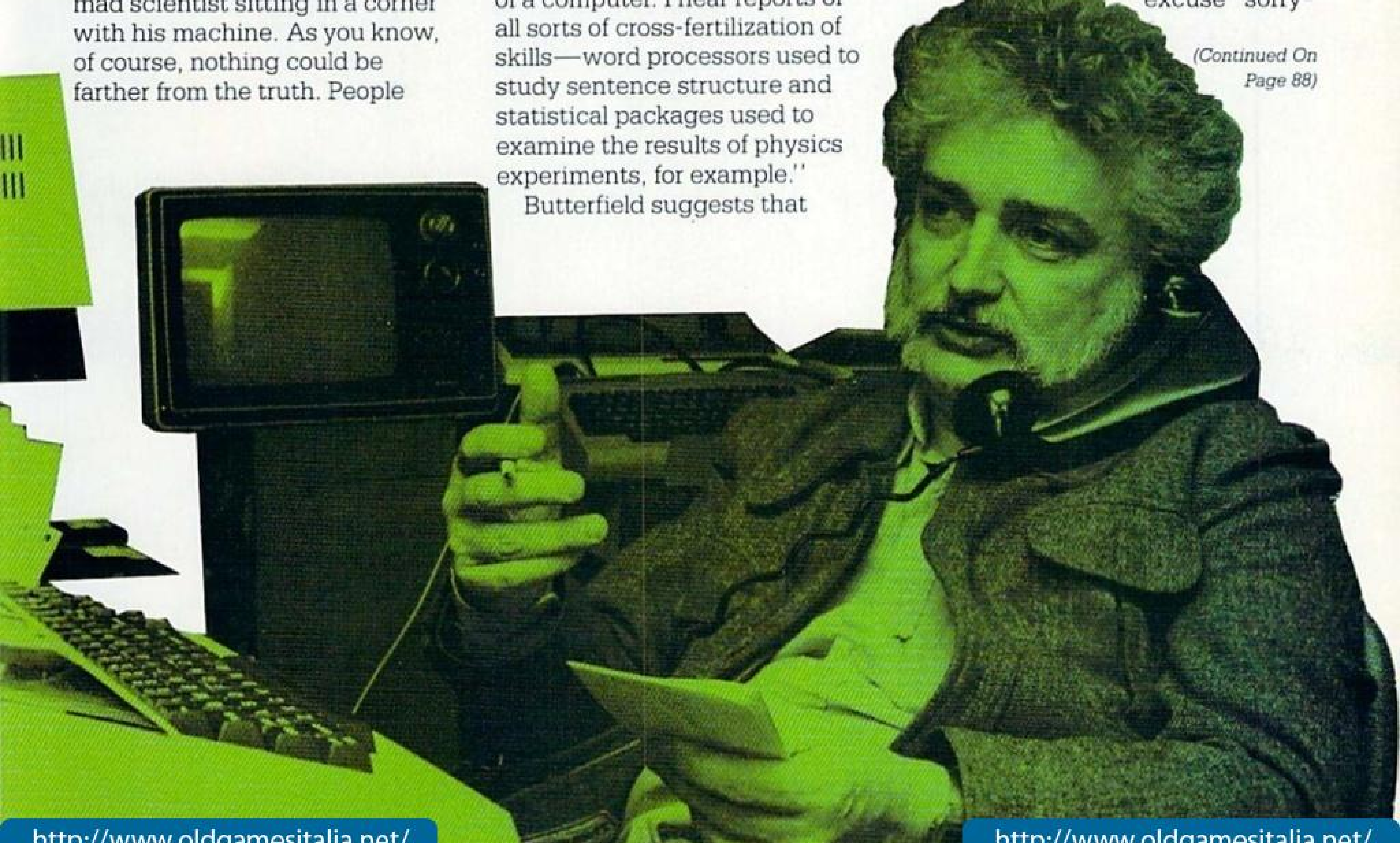
Butterfield is a founding member of the Toronto PET Users Group, which owes much to his generous support. He in turn points to Commodore as being "supportive of users", a very positive thing for Commodore owners.

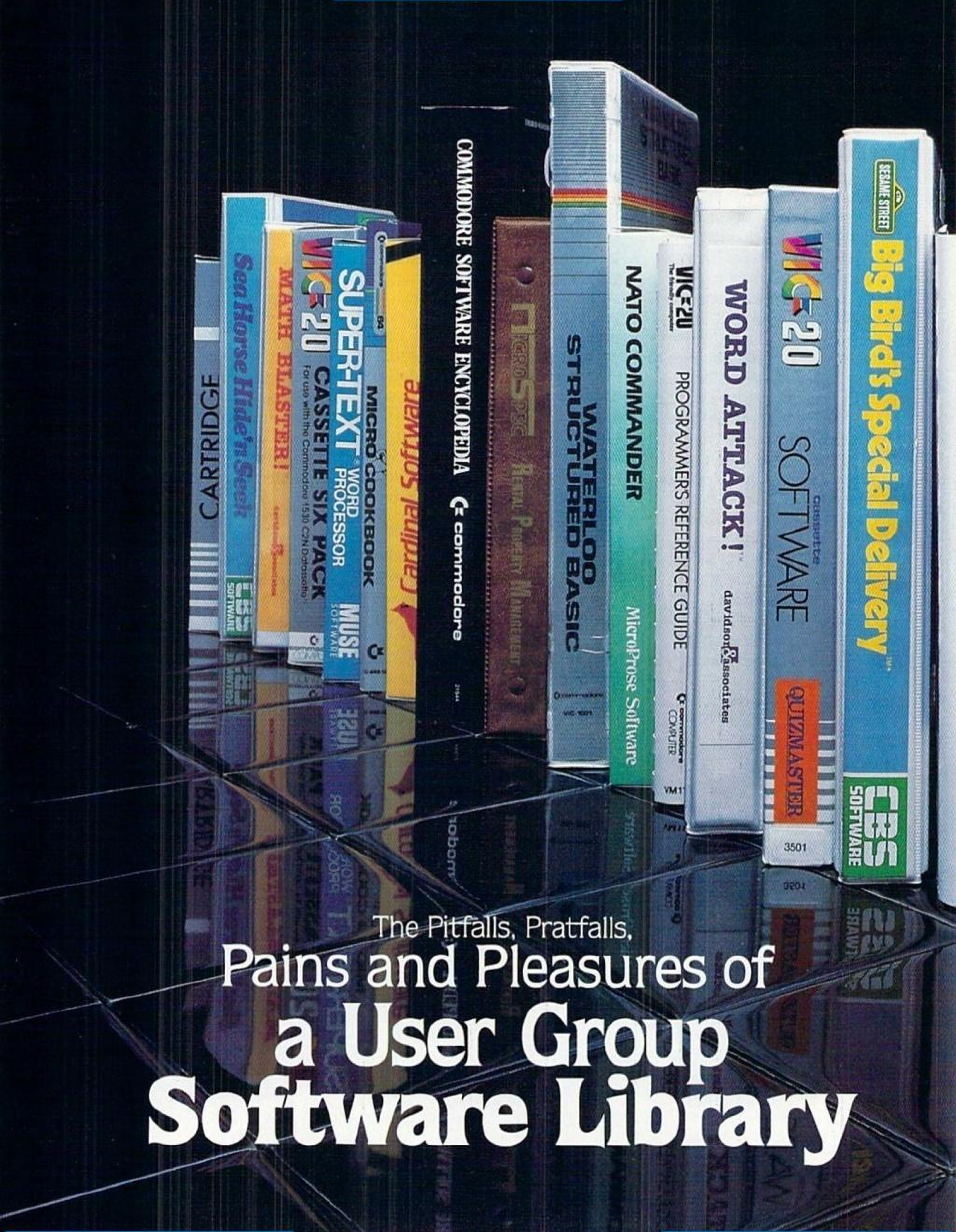
There is no doubt that as microcomputers increase in power and decrease in price more users will be children. Jim stresses that he is not an education expert but he speculates, "It might be useful to turn kids loose for a year with a room full of computers, because they're more likely to zero in on useful applications than any external structuring force. I would suspect that while we probably don't want to make all kids programmers, the capability to influence the machine's behavior is probably the key to the charm of a computer. I hear reports of all sorts of cross-fertilization of skills—word processors used to study sentence structure and statistical packages used to examine the results of physics experiments, for example."

Butterfield suggests that providing students with access to computers in the very early grades should perhaps be given priority. "As I understand the writings of Seymour Papert, the earlier a child becomes exposed to computers, the better it is likely to be. I have seen no evidence to contradict this. It seems to me that more important than anything formalized we teach young people about computers is that we get them familiar with the concept, we get their fears allayed, we make sure that the usefulness of computers is understood at an early age. By the time a student gets to high school, computers are an oddity. There's something not quite natural about them—something manufactured and solemn. If you use computers in grade two or three you simply understand that they're around and they're going to help you."

As more people develop a general understanding of the limitations and capabilities of computers, we will be less likely to be seduced into placing blind faith in a computer's predictions or putting up with the excuse "sorry-

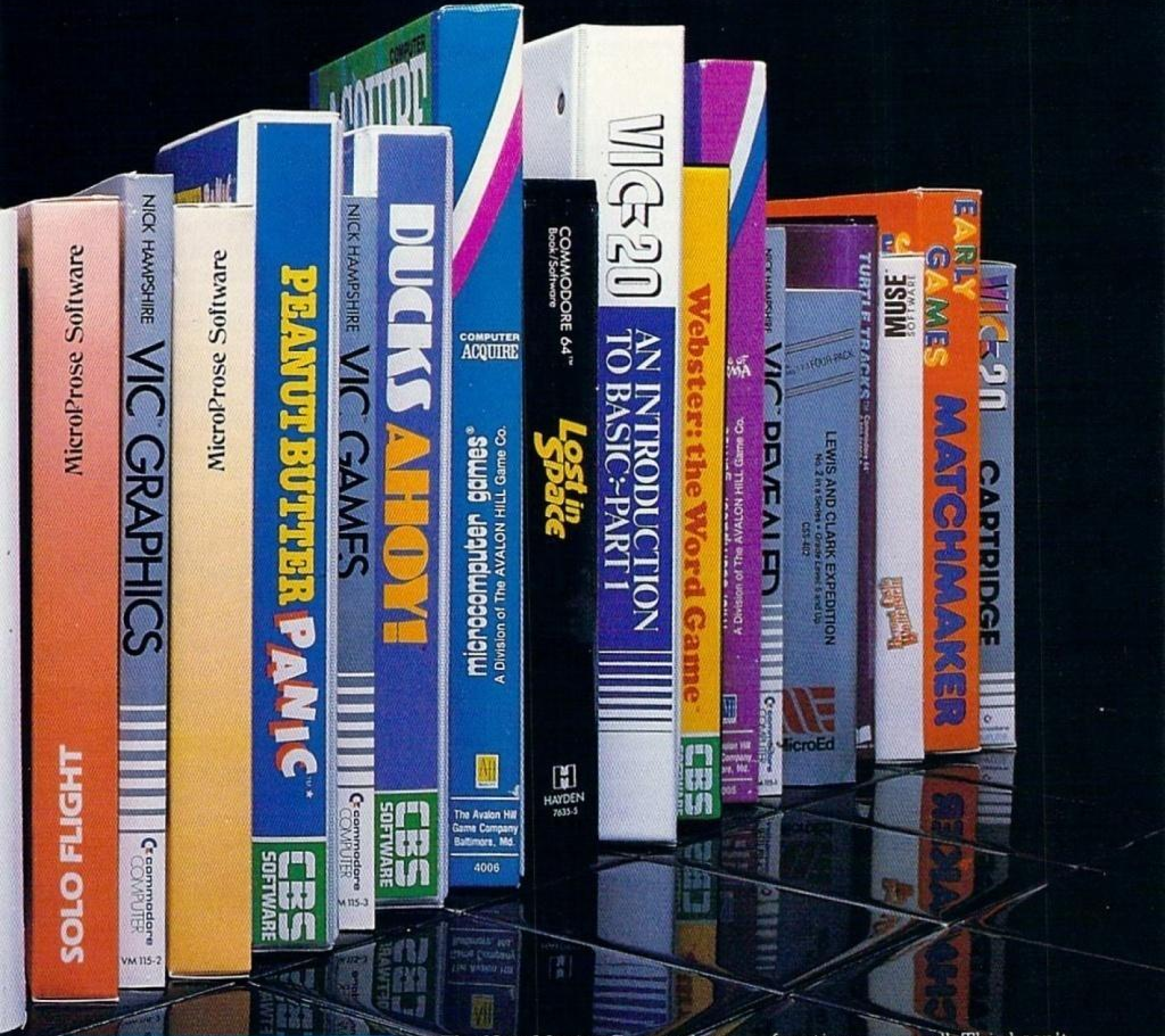
(Continued On Page 88)




CARTRIDGE
Sea Horse Hide'n Seek
CBS SOFTWARE
MATH BLASTER!
VIC-20 CASSETTE SIX PACK
For use with the Commodore 1530 C2N Datassette
SUPER-TEXT WORD PROCESSOR
MUSE SOFTWARE
MICRO COOKBOOK
Cardinal Software
COMMODORE SOFTWARE ENCYCLOPEDIA
commodore
MicroSpec
Rental Property Management
WATERLOO STRUCTURED BASIC
NATO COMMANDER
MicroProse Software
VIC-20
PROGRAMMER'S REFERENCE GUIDE
commodore COMPUTER
WORD ATTACK!
davidson & associates
VIC-20 cassette SOFTWARE
QUIZMASTER
3501
SESAME STREET
Big Bird's Special Delivery
CBS SOFTWARE

The Pitfalls, Pratfalls,

Pains and Pleasures of a User Group Software Library


MicroProse Software
SOLO FLIGHT
NICK HAMPSHIRE
VIC GRAPHICS
commodore COMPUTER
VM 115-2
MicroProse Software
PEANUT BUTTER PANIC
CBS SOFTWARE
NICK HAMPSHIRE
VIC GAMES
commodore COMPUTER
VM 115-3
DUCKS AHOY!
CBS SOFTWARE
COMPUTER ACQUIRE
microcomputer games
A Division of The AVALON HILL Game Co.
The Avalon Hill Game Company Baltimore, Md.
4006
COMMODORE 64
Book/Software
Lost in Space
HAYDEN
7635-5
VIC-20
AN INTRODUCTION TO BASIC-PART 1
Webster: the Word Game
CBS
A Division of The AVALON HILL Game Co.
VIC REVEALED
TURTLE TRACKS
LEWIS AND CLARK EXPEDITION
MicroEd
MUSE SOFTWARE
EARLY GAMES
MATCHMAKER
VIC-20
CARTRIDGE

By Peggy Herrington

New Mexico Commodore Users Group

A software library can be a great boon to a user group. Here's how to set one up and (hopefully) avoid disaster.

The New Mexico Commodore Users Group (NMCUG) is nearly two years old now and we continue to be encouraged by the dedication and time volunteered by so many of our members. We have meetings, demonstrations, arguments, classes and fun (not necessarily in that order) all the time. We also have a pretty good-sized software library (about 100 disks and oodles of tapes), which functions very well. This hasn't always been the case and if you're thinking of starting one, maybe we can help you around some of the pitfalls by sharing what we've learned along the way primarily by trial and error.

The Best Things In Life

A Commodore user group software library is a collection of public domain programs (on tapes

Photographer—Lee Wojnar

or disks) for the Commodore 64, VIC 20 and PET/CBM computers which can be accessed by members of the group. When these programs have been assembled and organized, you must let your membership know what's in your library and how they can get copies and contribute their own programs for other users.

Public domain means copyright-free

Nobody owns a public domain program: it may be used, modified, copied and enjoyed by anyone who can get their hands on it. In fact, it's perfectly legitimate to modify, elaborate upon and dress-up a public domain program, copyright and sell it for profit, provided you've changed it substantially. This does not take the original program out of the public domain.

Why would anybody want to put a program into the public domain? There are many reasons. Sometimes these programs aren't "user friendly." Instructions are usually written into the program itself (remember this if you put one of your programs in your library) and are not extensive. Once in a while, there are no instructions at all and *you* have to figure how to make it do its stuff.

Lots of public domain programs are plain; the author didn't have to take the time to add graphics or sound and tidy the screen formatting. If you like the program, you are free to dress it up or personalize it as you wish. Some programs were written way back when it wasn't considered important to copyright them. Then again, maybe the program has a little bug in it which, although it works, makes it unsuitable for marketing. Or it might be too short or simple to be worth publishing but it's just the thing for a beginning user.

"Old-timers" say that putting a program into the public domain returns them benefits sevenfold. Imagine seeing what was just a germ of an idea that you put into a simple program later developed into a masterpiece which lots of people have contributed to, obviously enjoyed and benefited from.

Public domain means available to all and contributed to by all. Studying these programs can teach you some wonderful techniques which you can incorporate into your own programs. There are thousands of programs in the public domain for Commodore computers. They lend strength and viability to Commodore enthusiasts and user groups all over the world.

Together is Better

Before we get into assembling the things that make up a software library and how you go about administrating it, there's one principle that's instrumental to the success of this endeavor. In fact, it may be the key to the success of a user group in all respects, and it's this:

Never, ever, under any circumstances, do anything by yourself.

Now this doesn't include showering and sleeping. But when the time comes to get something started for the group or it's time to do it again, you might begin to think it's easier to do it yourself than to go to the trouble of showing someone else how. Especially if that's what you did the last time and it didn't work out. The trouble with doing it yourself—as we are often reminded by our President, Betsy Byrne—is that this time next year you'll probably *still* be doing it, along with everything else. It's very important to get someone else involved (two or three people is better still), even if you have to do it over and over again, because eventually you *will* find the right people for the job and you can start something else or get back to what you wanted to do in the first place. Also, if only one person knows the "in's and out's" of a project and that person (for whatever reason) can no longer handle it, you'll have to start all over again when someone else takes over. That's why, in general, using committees works more smoothly for volunteer groups than relying only on individuals. This is especially important for a project as big as a software library.

Getting the Programs

There are several resources for public domain software for a user group library:

1. A local Commodore dealer.
2. Other Commodore user groups.
3. The Commodore Information Network on CompuServe.
4. Third party software vendors.

Commodore sells a series of public domain programs. Individually these disks are very affordable, but to buy the entire series to set up your library might run into more money than you care to part with.

If you don't ask, you won't get it.

One thing you should do is ask a local Commodore dealer to donate this series to your group, either by giving you the set or letting you copy it. This is how we established the NMCUG library. Keep in mind that, as long as your group is organized around a nonprofit structure, retailers will be quite anxious to have the good will of your membership. As an incentive, offer to include the dealer's advertisement in your library catalog (we'll get to that soon) for a specific period of time, say one year, in exchange for his help with setting up your library.

Don't be shy! Ask for things on behalf of your user group whether you're setting up your library or looking for a meeting place when you've outgrown someone's living room. The worst they can say is no.

Copyright-free is not cost-free

An alternative source of software is copying all or part of an existing user group's library. This isn't as easy as it sounds because of the logistics and work involved. NMCUG, for example, has a structure for this. For a small annual fee per member (which gets you other benefits as well) an affiliated user group can copy our library for $.50 per disk when they provide the media (disk and/or tapes) and the labor. But unless your group is geographically near a group offering a service like this or a member is planning a trip there for some coincidental reason, it would probably be cheaper to buy the software than to pay travel expenses for someone to make the copies.

Probably the best known Commodore user group around is TPUG in Toronto, Canada. They have an extensive software library, and I believe they have an affiliation plan, too, which would be worth looking into. At least one member of NMCUG also belongs to TPUG (our secretary, Rich Kotomori, who's also a doctor) and he occasionally orders disks from TPUG, which find their way into our library. You could certainly do worse.

The third way is by downloading programs from CompuServe. All the software on CompuServe is in the public domain so anything within the entire network would be permissable for your library—and there's some good stuff there, too. The entire public domain series from Commodore is on the databases in the Commodore SIG's. CompuServe costs $6.00 an hour online and we highly recommend you use VIDTEX as a terminal program if you plan to download programs.

Although this sounds like an attractive alternative, we suspect it might not be as good a choice as the others; we haven't done it much so we're not sure it's cost effective. The Commodore public domain series is organized by topic but the other databases are organized by date of submission, and getting all those programs categorized and onto the appropriate library disks would be an enormous project.

Several third-party software vendors are advertising enhanced public domain programs (including the Commodore series) for sale at what looks like reasonable prices. "Enhanced" means they've been debugged and have instructions, graphics and sound added. Look in computer magazines for their ads and compare costs and programs offered.

Whatever method you find best, be considerate of your group and anyone who helps you.

Be selective

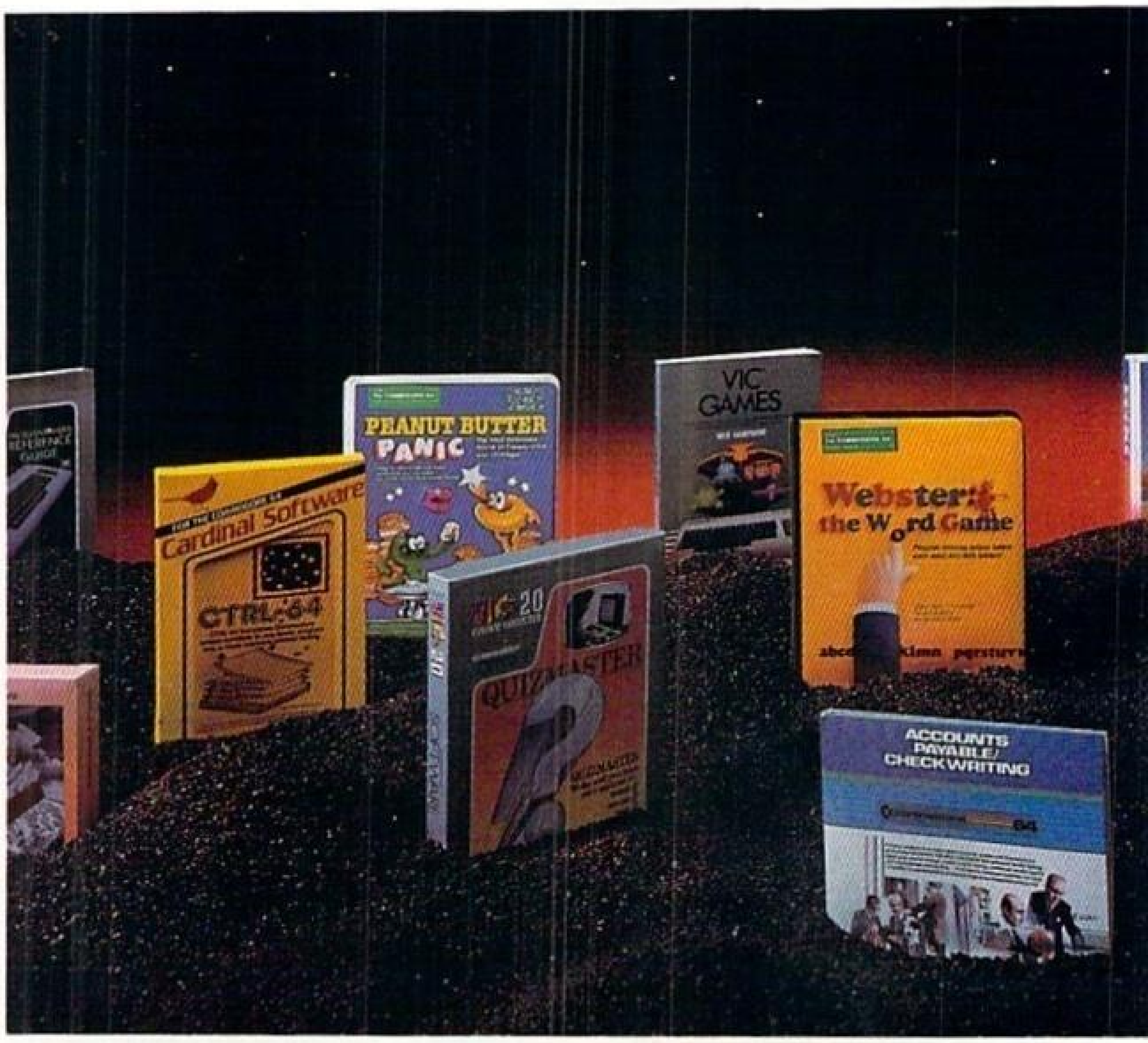
We weren't—we took everything offered to us and some of it, we're sorry to say, will probably never be used by anybody. Keep in mind that even if you're successful in getting the public domain programs themselves donated (if a store will let you copy them, for example, or even if you download them from CompuServe) you'll have a major expense in disks and tapes, especially if you're buying them retail. At an average of $2.50 each, 50 of them requires a cash outlay of $125.00. You can, however, reduce your costs and offer your members an added benefit by buying disks in bulk quantities, which we'll get to in a moment. Don't overlook the time involved in making the copies, putting them into categories on the media and, especially, the wear and tear on equipment.

Setting up Your Library

In conjunction with software, you'll need a database that can organize, keep track of and update your library and print catalogs for your members. (This same database can do double-duty, separately, of course, by keeping track of members' names, phone numbers, addresses, dues, etc. Neither of these chores are very complex, so most databases will fill the bill.)

Here's a list of the categories used by NMCUG for the various types of programs in our library. It will give you a starting point, anyway, for setting up yours:

Business Administration
Education
English
Games
Graphics
Mathematics
Music
Science
Technology
Utilities



The Great Debate

Not long after we established a software library, we found ourselves embroiled in an issue which catapulted us into what some of us recall as "The Great Debate." No afternoon tea session, this dialog continued for weeks (maybe months) and centered around the process by which members get copies of programs from the library.

The issue—whether to rent or sell library media—is complicated and there are pros and cons to doing things either way.

Renting Library Tapes and Disks

If your group is small, say under a hundred, having members check out disks or tapes, copy them at home and return the original medium in a couple of weeks will probably work out for you. The main advantage of this method (which we didn't realize then) is that it spreads the work out over lots of disk drives and won't cause the early demise of one 1541 forced to make all the copies for the group. But renting media wasn't trouble free.

•

Not everyone owns or knows how to use a copy program, especially new users, who, we feel, joined for help. This shifts the burden to them.

•

Someone has to chase after overdue media, with the unpleasant responsibility of chastising members or imposing fines.

•

Worse yet, what if a returned tape is crunched or a disk won't boot? Or a series of damaged media are returned by one member? Someone must decide if this was the result of accident or carelessness and inform that member of the consequences.

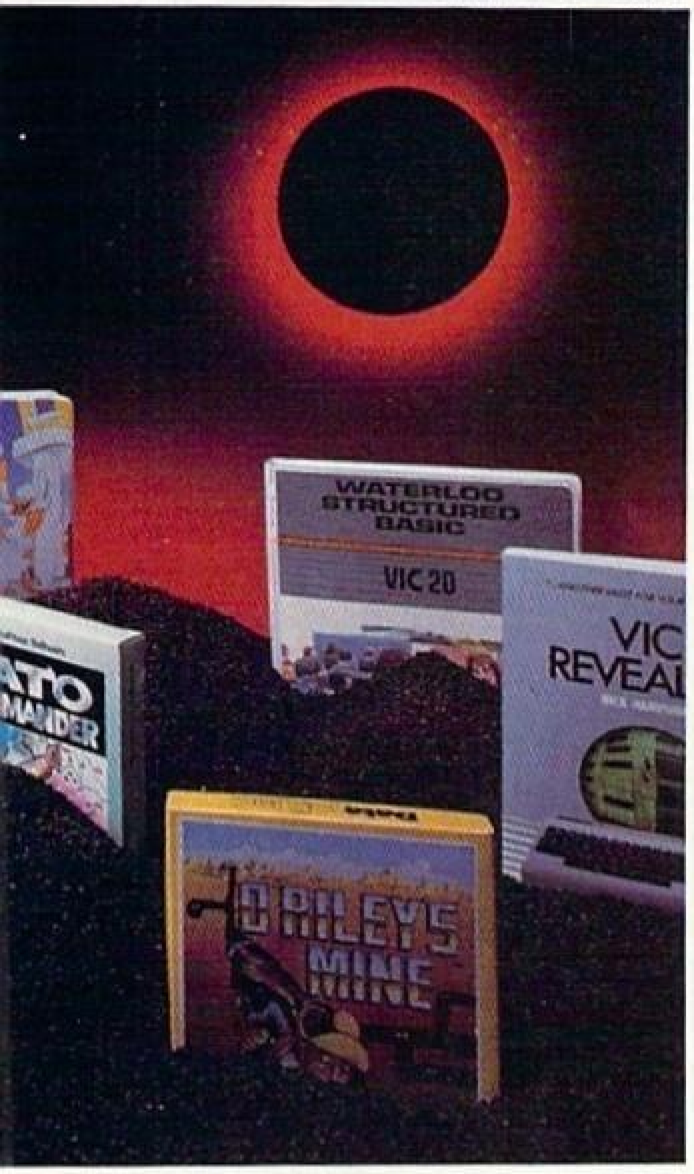
•

Should fines (if any) cover costs (if any) or be punitive?

•

How many rental copies of popular disks and tapes will be sufficient? One for each one wanted (which sort of defeats the purpose of renting) or do you establish a waiting list? And at what point?

Nobody, and especially not the hard-working librarian, wants to be responsible for making decisions like these or carrying out "police" actions. But what finally persuaded us to change to selling



Photographer—Lee Wojnar

media was the fact that rental isn't cost-efficient for members or, we projected, for the group. We were charging $3.00 to rent a tape or disk and by the time members bought the disk to copy onto they'd spent more than $5.00—which is what we sell disks for—and, if they buy it outright from the group, they don't have to bother with buying the media, making the copy or returning the original in a timely manner.

But, although outright sale of media sounds good, it's not without headaches either.

Selling Library Tapes and Disks

It *should* be easy. A member goes to a meeting and tells the librarian which disks or tapes he wants. The librarian makes them on the spot and hands them to the member who pays $5.00 each to the group. Simple, huh? Yes, as long as the librarian doesn't want to participate in the meeting and you don't have one librarian and one hundred members, some wanting disks, some wanting tapes and all wanting them right now. When that happens, you can still make copies at meetings—just do it by committee with a dual drive or several drives operating in tandem. We did this for a time until we decided there were better things to do at meetings than run the library. At that point we introduced order forms and a reasonable time delay—the librarian took orders and collected in advance, went home and made the copies and brought them to the next meeting where the members picked them up. And that worked for a while.

What didn't work after a while was the librarian's disk drive.

Don't expect a 1541 disk drive to hold up under commercial use

That's what you're asking of it if you make dozens of copies of disks and tapes (with a disk-to-tape copy program) on it every week. The way out of this dilemma is to get a commercial dual disk drive for the group or reorganize the library and spread the work over several members' 1541 disk drives. And that usually means several more librarians. NMCUG now has three: a head librarian (George West, a minister), who, with the board of directors, determines library policy (and coincidentally—honest!—has a dual drive), a C-64 librarian (Dave Klaussen) and a VIC librarian (Steve Kuehn).

Those Blankety-Blank Disks

If you decide to sell (rather than rent) your library media, you'll need a hefty supply of blank disks and tapes. We got tired of running to the store, did a little comparison shopping and now we buy them in bulk quantities (lots of 200 and more) just like a big-time software operator, with the added benefit that we sell blank disks to our membership at prices greatly below retail. We buy them for just under $1.50 each, use them for the library and sell them blank to members at 3 for $5.00. Of course, you must have operating capital to do this (ours is cared for by our trusty treasurer, Dick Harris who's a university professor) and it works out very well for the group as well as for individual members.

Administration and Up-Keep

As soon as you've got your library organized with the database and decided whether to rent or sell, it's time to print a catalog so your members will know what goodies to order. And, of course, you'll want to have order forms available at meetings (even if that's when the copies will be made) to keep your records straight.

Once your library is up and running you'll find that members will come up with other public domain stuff (perhaps even some of their own) and ask if they can trade whatever they've got for a tape or disk from the library.

NMCUG does this, and the only problem is putting a value on what the member wished to exchange for a disk (remember we value each library disk at $5.00). Our rule of thumb is one good, working program in trade for each disk (which holds 15 to 20 programs). "Good" is a subjective quality which is determined by the librarian handling the exchange.

And now we'll tell you a secret—something we don't share with everybody. Our library contains copyrighted software, too—programs typed in from magazines by our members. These are kept entirely separate from the public domain software because, in order to get copies of them, members must prove to the librarian that they own a copy of the magazine in which the program appeared. That way there's no copyright violation. It's a wonderful service for our group and completely legal, but if you do it handle it carefully and always insist on proof of ownership.

I didn't really finish the saga of operating the NMCUG library and filling orders. When we finally went (permanently, I suspect) to selling rather than renting media, we took orders at meetings and filled them by mail or pickup at the librarian's home. About that time, NMCUG had grown so large and active that several of us were longing to call our homes our own again. We decided to rent a small office. Now, library orders can be left there to be filled by librarians or volunteer office staffers (who are coordinated by our executive vice president, Susan Palmer, a graduate electrical engineering student), and picked up either there or at meetings. It's wonderful!

A successful library will continue to grow. Printing monthly catalogs of its contents can get to be expensive, as well as redundant for your old (as opposed to new) members. You might want to print monthly updates instead of printing the whole catalog and make a disk-of-the-month with these newly acquired programs so that members can get them without the ones that they've already got (or aren't interested in). The entire catalog with updates should be available for anyone who needs it and can be brought up to date (consolidated with the updates) every few months.

The Whole Ball Game

A software library is an important aspect of a successful user group but it certainly shouldn't be *the* most important thing you do.

Keep your perspective!

It's easy to lose it when you've spent so much time and energy (not to mention money) getting your library together and keeping it going. Computer users aren't "technies" anymore—especially Commodore users—and user groups are made up of folks from all walks of life. This makes your group a part of the community-at-large and in addition to putting together a library there are all sorts of other things you can do for your members.

•

Hold informative meetings where products relating to computing are demonstrated and examined.

•

Along with your regular meetings, consider Special Interest Groups (SIG's) for kids, teen-agers, mature users, beginning users, people who do want to learn BASIC and other special folks.

•

Publish a newsletter to showcase your members' accomplishments and writings and subsidize it with advertisements from local computer stores (I'm the editor of NMCUG's).

•

Establish a print library of magazines and books from members to donate to and borrow from.

•

Build a board of directors to objectively guide and oversee the group's activities as a whole.

And don't stop at the borders of your own membership. Go out into the community to promote computer literacy through schools and industry. You'll meet fascinating people, learn more about your community (and yourself) and have loads of fun. Who knows where it could lead? NMCUG's informal speaker's bureau has done demonstrations and answered questions for grade schools, university classes, groups of teachers and the welder's union, along with computer symposiums.

You won't have time to do all this yourself, so don't even try. Whether you're getting ads for your newsletter, fielding questions at a meeting or categorizing programs for your library, toss the ball (or the disk) to an interested member of your group and let them run with it. Your library, and your user group, will be the better for it. **C**

PRO

Profile: The Cal Poly User Group

A Commodore User Group on the Cal Poly campus serves both an educational and social function for engineering and architecture students.

California Polytechnic State University, San Luis Obispo, is a highly technical school incongruously located on the casual central coast of California. It is widely respected for its architectural and engineering schools. Cal Poly is also the home of a Commodore 64 user group that reflects the nature of the school; it is highly technical—composed mainly of engineers and architects—yet it manages to retain a loose, relaxed atmosphere.

The group is one year old. It was founded by Kalvin Kelley (now president) and his roommate Craig Northcutt. Kelley was working in the campus bookstore at the time and, "saw a need" for a club aimed at Commodore users. The initial response to the club was outstanding and it has continued to grow. Meetings regularly attract about 30 students.

The club's organization is elaborate and efficient. It has a full hierarchy including a president, vice-president, secretary-treasurer, librarian, activities director, public relations director and a faculty advisor. All officers must maintain a 2.0 G.P.A.

The club also has a constitution with written bylaws. One bylaw specifically prohibits "crashing" other computer systems and engaging in other unethical computer activities. There are three types of membership: active, composed of students (mostly engineers and architects, but also some social science students interested in word processing); as-

FILE

By
Angus W. Stocking

sociate, consisting of faculty and staff; and honorary, which covers any member not connected with the university (i.e, speakers and professionals from the community). Honorary membership is not allowed to exceed 10%. Dues are $2.00 a quarter and help pay for a newsletter and the acquisition of disks and software.

The basic goal of the group is to increase knowledge of the computer by exchanging information among users. Joe Mizrahi, an engineering major, says, "Getting involved with other people is the best way to learn. I want to know what the Commodore can do that isn't available in books. The best access I have to this is the experimentation of others." This feeling is echoed by most of the group. Kalvin Kelley, for instance, "hates reading books" and thinks that the club is a better way to learn.

One method of exchanging information is the club's self-ranking system. Members rank their own computer skills from one to nine, nine being highest, and their rank is included on the club's phone list and distributed to members. Anyone can call a higher ranking member for help. The club's newsletter also helps in the exchange of information. It lists product reviews, items for sale, names and addresses and other useful facts. There are also actual teaching "sessions" at members' houses or after meetings if computers are brought (they usually are). These sessions are for both beginners and experienced users wishing to learn advanced techniques such as machine language programming, high-quality graphics and word processing techniques.

A beneficial side effect of this information flow is that members often have to spend less time on homework. This has become one of the group's most appealing aspects. Since most members are in technical majors, most of the programs developed by the club have engineering applications. For instance, any member has access to programs that deal with vector problems, multiplicative equations, definite integration, repetitive functions and more. All of these are uniquely suited to the Cal Poly curriculum.

PROF

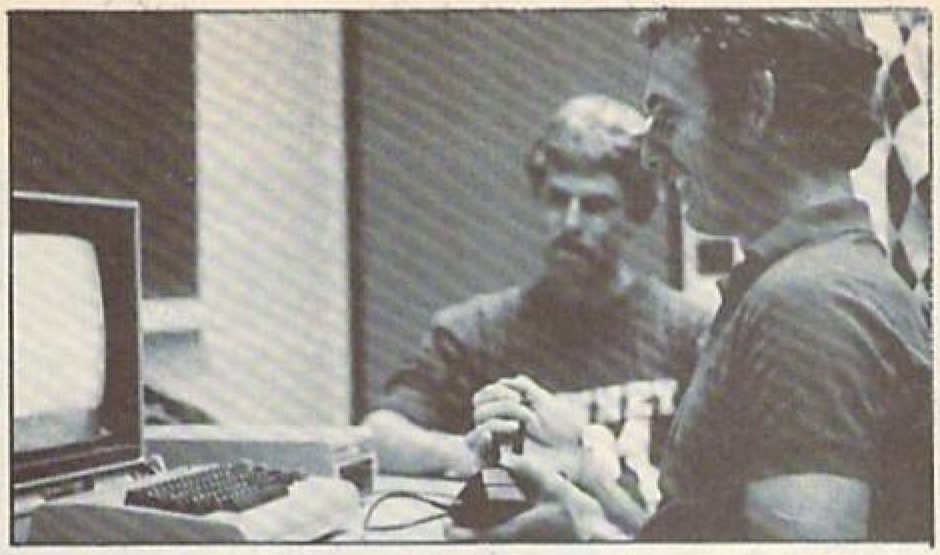
The group is involved in many activities, most of which focus around the meetings. A typical meeting might feature a speaker—perhaps a professor or a businessman who works with Commodores. Then the club would discuss upcoming events and projects. After official business is taken care of, an unstructured period is declared, which the club whimsically calls "the social hour". Much is accomplished at this time. This is when teaching sessions and game contests take place. The conversation gets raucous as members compare notes, check rumors and pass along helpful hints. There are, of course, activities outside the meetings such as "pizza feeds" at local parlors. Also, the group plans to enter a booth in an upcoming campus fair. In it four machines will be displayed, two to show adults what the club is about and two "for kids to play with."

There are also monetary advantages. The group buys some items, such as disks, in bulk so that members can get them at considerable savings. There is also a respectable amount of software kept by librarian Michael Flaherty which has been developed by members or bought with club funds. All members have access to these materials.

Presently Cal Poly has two time-sharing systems with several terminal locations on campus. However, group president Kelley and most group members feel that Poly will definitely go away from this because of the system's clumsiness (they refer to the mainframes as "dinosaurs"). Instead, they foresee a system that any student with a personal computer and modem can plug into. In such a setting the role of computer clubs will be even more significant. Members will be able to do homework, relax with games and even socialize via letter-writing programs. In Kelley's words, "The computer is more than one dimensional. Its role will continue to increase." The Cal Poly user's group can't wait.

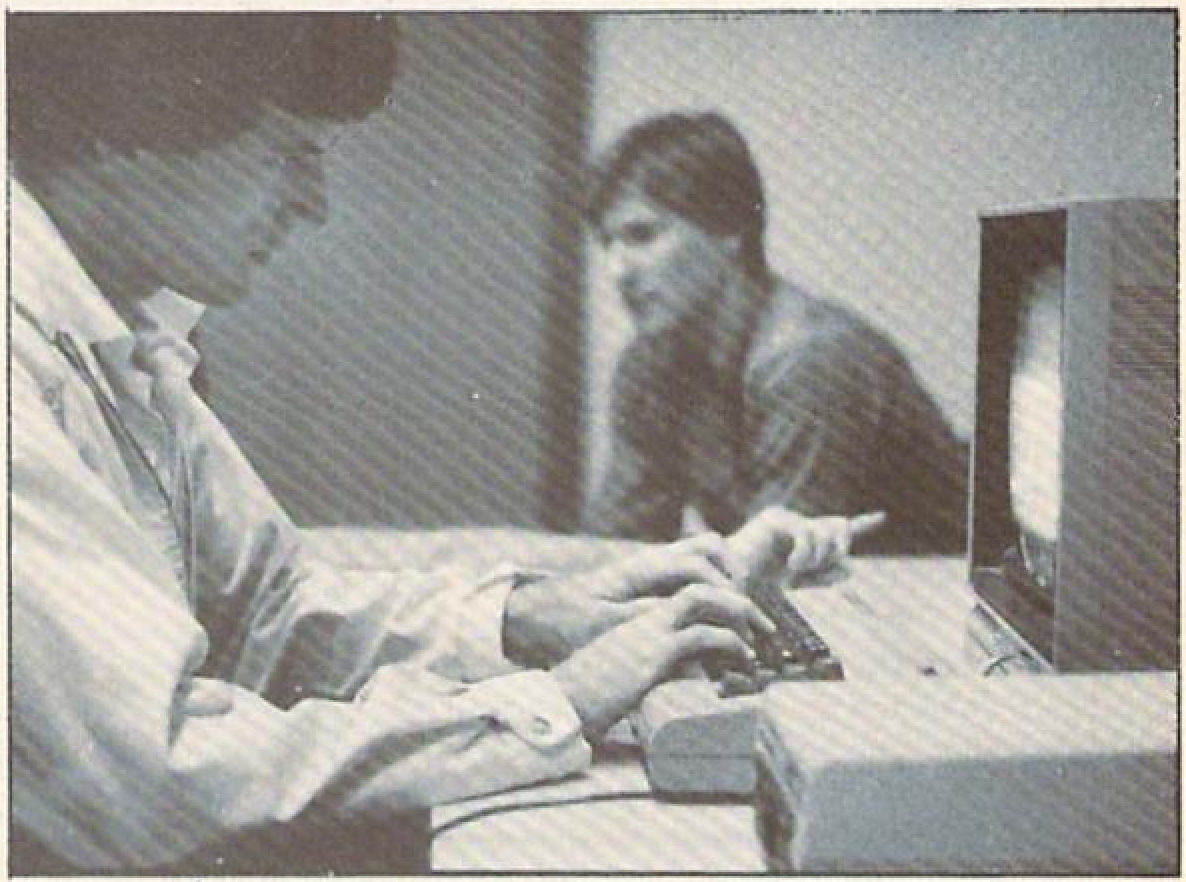
The club continues to grow. They hope that increased activities and the campus fair will attract more members. They recently established contact with computer clubs in Los Osos and Paso Robles, two cities close to Cal Poly. Eventually they hope to coordinate activities with these groups. Meanwhile the phone list gets longer, the newsletter gets more elaborate and the calendar of events gets fuller.

This group shows that even the most technical fields can be approached with a casual attitude. Graduating members can't help but take this attitude with them



ILE

into their professional lives. High-tech fields will become more competent and computer-oriented and, at the same time, more easygoing and accessible. With a combination like this, developed in clubs like the one at Cal Poly, the future for small computers like the Commodore 64 looks bright indeed. **C**



Members of the CalPoly user group learn from each other—and have fun as well—at their regular meetings.

Children of Kong

(Continued From Page 33)

jump over obstacles using the joystick button. They temper this ability by making you jump accurately and squashing your character if you miss.

Dino Eggs and *Lode Runner* are the exceptions to this rule. Since you're outnumbered, the ability to fall any distance was necessary in *Lode Runner* to give you a chance. And with all the monsters running around in *Dino Eggs,* it's the least the programmers could do.

In *Lode Runner,* the button lets you dig a trap, which can hold your pursuers while you escape. You can fall into these traps too, but you can use them to your advantage for a quick getaway by falling through to safety.

Dino Eggs uses the button for two purposes. When the joystick is pointing down, the button lets you pick up an object (an egg, a piece of wood or "the power"), put one down or knock off a shell covering an object. When the joystick is in any other position, you jump as in any other game.

You can shoot your pursuers in *Crazy Conveyors,* which scores points but doesn't help much otherwise. The monsters are reborn at the top of the screen and they just keep following you.

Frantic Freddie ignores the fire button altogether. The monsters will probably get you very often despite what you do. Bullets or something would have helped here.

Timer Bonuses and Penalties

Jumpman and *Jumpman Junior* offer bonuses for finishing rounds within time limits. They also let you adjust the speed of your player, which helps you get higher bonus scores.

Hard Hat Mack, Crazy Conveyors and *Miner 2049er* also give you a bonus for completing the round in time. To add to the pressure on you, they also will cost your character a life if you don't finish in time.

Bells, Whistles and Music

The music in *Frantic Freddie* is so outstanding that I have to give it a special plug. If you ever buy a program just for the music, here it is. My wife Karen actually asked me to turn up the volume while I played this one and you can be sure that has never happened before or since. The songs include renditions of modern numbers like Queen's "Crazy Little Thing Called Love", Paul Simon's "Kodachrome" and Electric Light Orchestra's "Don't Let Me Down", along with a couple of ragtime numbers and the disco version of Beethoven's Fifth.

Another nice touch in *Frantic Freddie* is the appearance of interludes, like the "half-time shows" in *Pacman* and *Dragonsden.* The first appears between rounds two and three and the second after round four. The only disappointment is that the interludes repeat after only two.

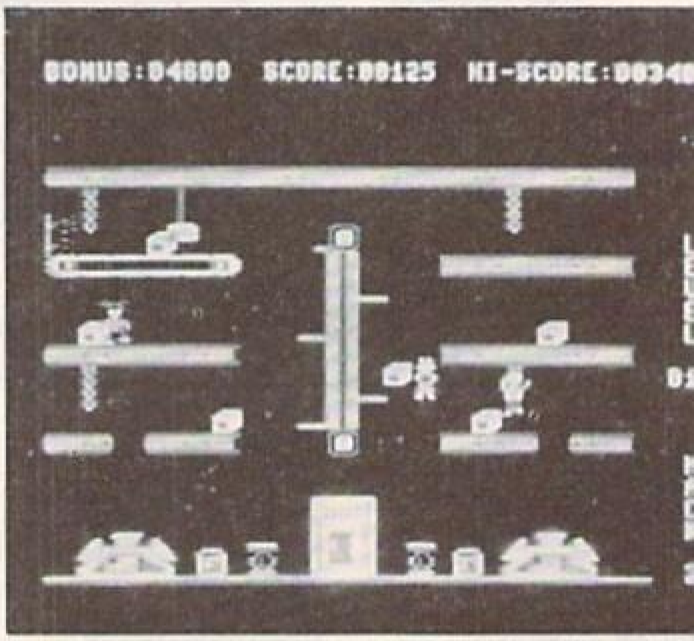
The sound effects in *Jumpman* and *Jumpman Junior* are well done. From bombs dropping to bullets exploding, the sounds are realistic and entertaining.

Play Action

As I mentioned before, all these games are fun to play. Some, however, are easier for mere mortal gamers to play, and others require split-second timing and designer joysticks.

Jumpman, Lode Runner and of course *Donkey Kong* have a broad appeal. The first few rounds are easy to master, getting you into the game in a hurry. These games also contain harder levels which you can reach without playing all the preceding rounds.

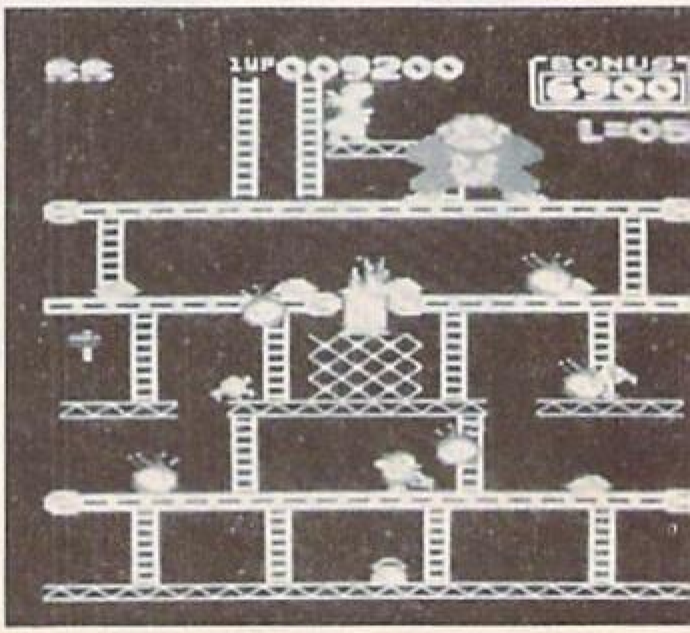
Crazy Conveyors is a game in evolution. The first version I saw was much harder than the current one, suffering from cheating monsters. At the last minute before my deadline I was shown version three of this game, which is a big improvement. Although the fire button didn't seem sensitive enough to let me shoot with the timing I needed, it is reasonably easy to play now.



Hard Hat Mack

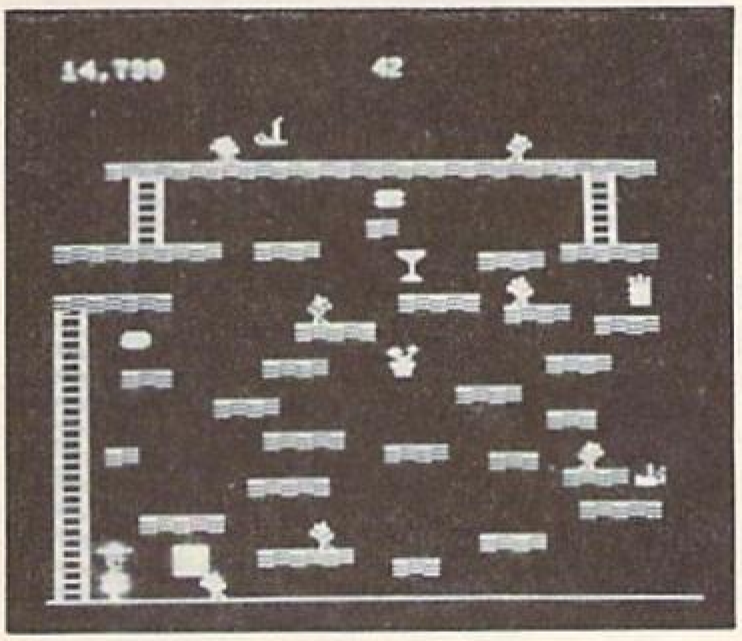
Miner 2049er has some interesting rounds, but I've never made it past the sixth level. Since the game isn't programmed to let me skip to another round, I may never see what all ten look like!

Jumpman Junior is much harder than the original *Jumpman.* Most people would probably find that they should graduate to this one after they master *Jumpman* senior.



Donkey Kong

Dino Eggs is one of the hardest games in the bunch. There's a lot going on here. By the time you reach the tenth round there are snakes crawling, lizards flying, fires burning, eggs hatching and spiders eating the poor defenseless babies. If you like action games like the arcade *Robotron* where there's a lot to watch, you'll be intrigued by this.



Miner 2049'er

Finally, I wouldn't recommend *Hard Hat Mack* or *Frantic Freddie* for their play action. *Mack* is so tough that I've never made it through four rounds during one game. There isn't enough variety to make it interesting because you must depend on memorizing the pattern and executing it perfectly. *Frantic Freddie* is frustratingly hard, with cheating monsters that get you nearly every time. C

Neil Harris

John O'Brien

Game Gripes

By John O'Brien
Commodore Publishing

Inspired by Andy Rooney of 60 minutes, I'm going to list things that annoy me about computer games in general. These opinions do not necessarily reflect those of the management or any other beings in the universe. Admittedly, some of the best games have some of the most annoying problems and some of the worst have some of the best features. It's the overall play that is important, but every game could be improved if game designers would take some of these things into consideration.

Don't you hate it when the higher levels of play just go faster? This is usually boring if you've already beaten the game on the lower levels. It wouldn't be so bad if there were also some other new twists added as you go along. A related gripe—don't just have more monsters attacking, but make it so new strategies and techniques are needed on each level.

Don't you hate it when you're ready to play a new game and it starts but you don't because your joystick is in the wrong port? Why not have all games use port one unless it's a two player game?

Don't you hate games that are too simple?

Don't you hate games that are too hard?

Don't you hate it when games have music that is so annoying that you're willing to risk a lower score by turning the volume down and missing important warning sounds?

Don't you hate poker games that don't let you see the computer's hand when you drop? I know it's like that in real poker, but I don't like it there either.

Don't you hate games based on other popular games that pale by comparison to the original? On the other hand, don't you love it when a game based on another game improves upon the original idea and gets rid of the annoying features of the original?

Don't you hate games that are too fast?

Don't you hate games that are too slow?

Don't you hate quiz or trivia games that have

(Continued On Page 72)

games & recreation

high scores

Jump into our on-going competition (for Commodore-manufactured games only). In order to have your high score published, you must send in a photo of the winning screen showing the score. Make sure your name and address are on the back of the photo. If your score is high, we'll run your name and score as soon as we can get it in. Be patient. We work far ahead putting an issue together, so it might take a while for your score to show up. Please note that we've retired several old games, since we stopped getting new scores for them.

VIC 20 Games		**Score**
CLOWNS	Jon Kirkbride, Jr., Cedars, PA	111,560
COSMIC CRUNCHER	Joe Lindo, Burlington, Ontario	998,180
GORF	Chad McCubbins, Coatesville, IN	998,910
JUPITER LANDER	Christopher Champlain, St. Petersburg, FL	207,400
MOLE ATTACK	Ryan Phillips, Montpelier, VT	427
MONEY WARS	Bob Grant, Bensalem, PA	81,950
OMEGA RACE	Jim Nelson, S. Elgin, IL	1,502,300 (5 ships)
RADAR RAT RACE	Jennifer Zaruk, San Diego, CA	147,240
RAID ON FORT KNOX	John H. Kohler, Daly City, CA	15,262
SEA WOLF	Alieia Kondalski, Toledo, OH	29,500
SKY IS FALLING	Christina Zip, Toledo, OH	22,080
SUPER SLOT	Judith Wright, Cheektowaga, NY	10,960 coins (game rolled over at 9,999)
SUPER SMASH	Amy Talmadge, La Jolla, CA	31,630
VIC AVENGER	Nathan Brown, Newark, DE	23,120
Commodore 64 Games		
AVENGER	Britt Feldhaus, Edina, MN	33,600
CLOWNS	Carla Heiland, S. Pasadena, CA	94,180
INTERNATIONAL SOCCER		
JACK ATTACK		
KICKMAN	Josh Flint, Farmington, ME	577,200
LEMANS	Chris Waldroff, Deephaven, MN	274,460
OMEGA RACE	Jonathan Wells, Watertown, CT	692,950 (5 ships)
SEA WOLF	George M. Fleming, Humboldt, KS	35,400
STAR RANGER		
STARPOST	Scott Barrish, Willowick, OH	712,900

If your score didn't set a record this time, keep playing! Maybe you'll topple these champion gamesters next time! C

Tic Tac Toe for Two

For the VIC 20

By Robert Johnson

"Tic Tac Toe" is a challenging game for two players to match wits against each other. In this game, Player 1 is "X" and Player 2 is "Y". Each player enters their X's and O's until someone has won or until no one can win.

The game will let you know whose turn it is. It will also let you know who won and ask you if you want to play another game. It takes all the work out of the game and allows you more time to concentrate on playing the game. Once you get started it will be hard to stop. **C**

Tic Tac Toe

```
10 S=0
20 C=0
30 P=0
40 PRINT CHR$(147)
50 FOR A = 1 TO 4
60 PRINT
70 NEXT A
80 PRINT "[SPACE6,SHFT O,CMDR T2,
   SHFT O,CMDR T2,SHFT O,CMDR T,
   SHFT P]"
90 PRINT "[SPACE6,CMDR G]1
   [CMDR G]2 [CMDR G]3[CMDR M]"
100 PRINT "[SPACE6,CMDR G,SPACE2,
    CMDR G,SPACE2,CMDR G]
    [CMDR M]"
120 PRINT "[SPACE6,SHFT O,
    CMDR T2,SHFT O,CMDR T2,
    SHFT O,CMDR T,SHFT P]"
130 PRINT "[SPACE6,CMDR G]4
    [CMDR G]5 [CMDR G]6[CMDR M]"
140 PRINT "[SPACE6,CMDR G,SPACE2,
    CMDR G,SPACE2,CMDR G]
    [CMDR M]"
150 PRINT "[SPACE6,SHFT O,
    CMDR T2,SHFT O,CMDR T2,
    SHFT O,CMDR T,SHFT P]"
160 PRINT "[SPACE6,CMDR G]7
    [CMDR G]8 [CMDR G]9[CMDR M]"
170 PRINT "[SPACE6,SHFT L,
    CMDR @2,SHFT L,CMDR @2,
    SHFT L,CMDR @,SHFT @]"
180 PRINT
190 PRINT "PLAYER 1 ENTER YOUR
    LOCATION FOR X[LEFT42]"
200 A=24
201 GOSUB 300
210 IF S=1 THEN GOTO 260
220 PRINT "PLAYER 2 ENTER YOUR
    LOCATION FOR Y[LEFT42]"
230 A=15
240 GOSUB 300
250 IF S=0 THEN GOTO 190
260 GET C$
270 IF C$="" THEN GOTO 260
280 IF C$="Y" THEN GOTO 10
290 END
300 GET R$
310 IF R$="" THEN GOTO 300
320 P=P+1
330 IF R$="1" THEN POKE 7819,A
    :GOTO 430
340 IF R$="2" THEN POKE 7822,A
    :GOTO 430
350 IF R$="3" THEN POKE 7825,A
    :GOTO 430
360 IF R$="4" THEN POKE 7885,A
    :GOTO 430
370 IF R$="5" THEN POKE 7888,A
    :GOTO 430
380 IF R$="6" THEN POKE 7891,A
    :GOTO 430
```

(Continued On Page 72)

Tic Tac Toe

(Continued From Page 71)

```
390 IF R$="7" THEN POKE 7951,A
    :GOTO 430
400 IF R$="8" THEN POKE 7954,A
    :GOTO 430
410 IF R$="9" THEN POKE 7957,A
    :GOTO 430
420 GOTO 300
430 IF PEEK(7819)=PEEK(7822) AND
    PEEK(7822)=PEEK(7825) THEN
    C=PEEK(7825)
440 IF PEEK(7885)=PEEK(7888) AND
    PEEK(7888)=PEEK(7891) THEN
    C=PEEK(7891)
450 IF PEEK(7951)=PEEK(7954) AND
    PEEK(7954)=PEEK(7957) THEN
    C=PEEK(7957)
460 IF PEEK (7819)=PEEK(7885)
    AND PEEK(7885)=PEEK(7951)
    THEN C=PEEK(7951)
470 IF PEEK(7822)=PEEK(7888) AND
    PEEK(7888)=PEEK(7954) THEN
    C=PEEK(7954)
480 IF PEEK(7825)=PEEK(7891) AND
    PEEK(7891)=PEEK(7957) THEN
    C=PEEK(7897)
490 IF PEEK(7819)=PEEK(7888) AND
    PEEK(7888)=PEEK(7957) THEN
    C=PEEK(7957)
500 IF PEEK(7951)=PEEK(7888) AND
    PEEK(7888)=PEEK(7825) THEN
    C=PEEK(7825)
510 IF C=0 THEN GOTO 570
520 IF C=24 THEN B$="1"
530 IF C=15 THEN B$="2"
540 PRINT "PLAYER "B$" HAS WON
    [SPACE18]"
550 PRINT
560 GOTO 600
570 IF P<9 THEN GOTO 640
580 PRINT "NO PLAYER HAS WON
    [SPACE20]"
590 PRINT
600 PRINT "DO YOU WISH TO PLAY
    ANOTHER GAME"
610 PRINT "ENTER Y OR N"
620 S=1
630 C=O
640 RETURN
```

Game Gripes

(Continued From Page 69)

a set number of questions and don't have any data disks available when you start to know most of the answers?

Don't you hate adventure games that don't give you enough clues to make any progress? Of course, for some people that is half the fun.

Don't you hate games that are based on smash movies and are heavily promoted, but are no good? The worst part is that once a company buys the rights to it and doesn't create it correctly—no one else can fix it.

Don't you hate games that don't take advantage of the capability of the new machine they are adapted to? This is especially true of games that were originally written for a small unsophisticated machine. Later, when versions for a bigger computer come out, updated programs should take advantage of the increased capability of the new machine.

Don't you hate inappropriate sound effects?

Don't you hate inappropriate graphic effects?

Don't you hate when a game can't be started by hitting the fire button? When you're playing a game over and over in a comfortable spot, you don't want to get up and hit a function key.

Don't you hate games that go immediately from one screen to another with no time to get your wits together? This technique can be good in games that have short rounds but some pause is needed. The pause feature that some games have now solves that problem.

Don't you hate it when you can't reset a game when you get off to a bad start? This is most annoying when in a multilevel game you lose two of your three lives in the first screen and you normally make it to screen 25.

Don't you hate it when games only give you one life and you can get killed at any time by a random factor against which there is no defense?

Don't you hate long introductory scenes or songs that have to play all the way through every time you play? They're not always at the beginning; some are between screens. A lot of them are very well done and amusing, but after you've played the game 50 times . . .

Don't you hate games that don't live up to the fantastic art on the package?

Don't you hate games that don't keep a high score list?

Don't you love games that don't have too many "Don't you hates" in them?

Well, that's all I could think of. If you can think of more, drop me a line and maybe some day we'll do it from a positive angle called "Don't you love . . ." **C**

Traffic in the Fast Lanes

For PET/CBM and Commodore 64

By Dean S. Rossa

This program has evolved in my family over several years. A longer version was written by my husband five years ago. The game has that addictive quality that is characteristic of good games. It keeps users sitting at it for hours and attracts them back to it.

I'm not a game player and was never interested enough to read the program and follow the logic but I did adapt the old version of the game to run on the 8032 when I started to work with that machine. Recently when a couple of my students became hooked on the game, I encouraged them to try to write the game themselves. I showed them techniques that I would use and found that the game actually required very little code. Much of the accompanying code is not integral to the game.

The first two lines enable the program to run on any PET, 8032, or 64. The next three lines give the user some control over game difficulty. The track width in the original game was fixed.

The array P$ defines TW positions on the road at the bottom of the screen. One of the positions, X, is chosen at random and an obstacle is printed to it. Printing at the bottom of the screen makes the obstacles roll toward the car. The driver maneuvers the car left and right to better his time without a collision.

Fast Lane

```
100 SA=32768: PRINT"[CLEAR]"
    :IF PEEK(1024)=32 THEN
    SA=1024:WD=40:F64=55296
    :GOTO 120
110 PRINT CHR$(142):F64=1024
    : WD=40: POKE SA+1024,96
    :IF PEEK(SA)<>96 THEN WD=80
120 PRINT"MOVEMENT KEYS
    : 1 TO GO RIGHT"
    :PRINT"[SPACE15]2 TO GO LEFT"
130 PRINT:  INPUT"TRACK WIDTH,
     BETWEEN 5 & 15";TW
    :PRINT"[CLEAR]"
140 IF TW<5 OR TW>15 THEN TW= 10
150 DIM P$(TW):   SC= SA +4
    :  P$="[HOME,DOWN24]"
160 P$(1)=P$+"[RIGHT]"
    : FOR I=2 TO TW
    : P$(I)=P$(I-1)+"[RIGHT]"
    : NEXT
170 FOR I=1 TO 22:PRINT P$ "
    [CMDR M]" P$(TW)  "[CMDR G]"
    : NEXT
180 POKE SC-1024 +F64,1
    : POKE SC,65
190 TI$="000000"
200 X=INT(RND(1)* TW)+1
    : GET K$
210 IF K$="1" THEN S=SC: SC=SC-1
    :IF SC<SA+1 THEN SC=SA+1
220 IF K$="2" THEN S=SC: SC=SC+1
    :IF SC>SA+TW-1 THEN
    SC=SA+TW-1
230 IF PEEK(SC+WD)<>32 THEN
    PRINT P$"[CMDR M]
    "   P$(TW)TI$:FOR K=1 TO 1000
    :NEXT:GOTO 190
240 PRINT P$ "[CMDR M]" P$(X) "
    [SHFT Q]" P$(TW)"[CMDR G]"
    :POKE S,32:POKE SC-1024+F64,1
    : POKE SC,65
250 GOTO 200
65280 REM****************** D.
      ROSSA, JONESBORO,
       ARK **********************
```

C

David Malmberg

Write Your Own "Pick-A-Path" Adventures

By David Malmberg

Using the Commodore 64 you can create your own adventure programs.

Next to the explosion of personal computer books and romance novels, probably the most significant publishing event of the last few years has been the growing popularity of books which allow the reader to determine the outcome of the story by making choices at various points in the story as the plot unfolds. There are several different series of books that use this same technique. Some of the most popular are the "Choose Your Own Adventure" series by Bantam Books, the "Endless Quest" books by TSR, the "Plot-Your-Own-Adventure" books by Simon & Schuster, and the "Which Way?" and "Play-It-Your-Way" stories by Pocket Books. Most of these books are aimed at young readers, but the overall format can be equally appealing to older readers in the hands of a skillful and imaginative writer.

The basic structure for all of these books is to have each page describe an episode in the story. At the bottom of the page, the reader is either (1) directed to another page to continue the same episode or (2) presented with several alternative choices—each of which sends the reader to a different page and a different plot twist. For example, a page might describe a baseball game where it is the bottom of the ninth inning with two outs, bases loaded and your team leading by two runs. The best hitter from the other team, "Long Ball" Jones, has just come up to bat and you might be presented with the following choices:

1. Try to strike him out. (Go to page 45)
2. Walk him. (Go to page 50)
3. Change to your best relief pitcher. (Go to page 87)

"Pick-A-Path" Adventure Skeleton Program

This kind of story format is ideal for translation to a personal computer. Each page becomes a new screen of text and the plot choices (if any) are shown at the bottom of screen. Listing 1 is a skeleton program that can be used to help you write your own "Pick-A-Path" adventures for the Commodore 64. To use the skeleton program, just enter the title of your story in line 65, and your name (as author) in line 72.

Each "page" of text is entered as a group of PRINT statements. For example, look at the blank PRINT statements in lines 111 to 124 in Listing 1. Your story's plot choices (up to five) are determined by the string variables AC$(1) to AC$(5) and the value of NU. See lines 160 to 165. After you have specified your choices, the GOSUB 22 (in line 70) and the ON BR GOTO (in line 180) cause your story to follow the plot twist you select.

The subroutine starting at line 22 of the skeleton program first prints the message "MAKE YOUR CHOICE:" and then displays your plot choices. The first choice (as specified by AC$(1)) will be highlighted (i.e., in reversed characters). When you hit the cursor down key, the highlighting will move to the next plot choice. When you have highlighted the alternative you want to select, hitting return will cause the program to branch to the appropriate "page." This subroutine also enables you to change color combinations by hitting the function keys F1, F2 and F3. If you enter the subroutine by GOSUB 23 (rather than 22), the "MAKE YOUR CHOICE": message will not be printed. This entry point is used whenever your story continues merely to another page without any plot choices.

The routine starting at line 55 of Listing 1 will also be very useful to you. It is a "standard" ending for your story. GOTO 55 whenever you wish to print the final score (if any) and present the reader with the chance to quit or to play again. The score is determined by the variable SC and will only be printed if SC is not equal to zero. If you don't wish to have a score in your story, you need not worry about SC because it is initialized to zero in line 97.

An Example and Some Useful Tips

Listing 2 is an example of how you might begin your own "Pick-A-Path" adventure. These program lines would have to be combined with lines one to 99 from the skeleton program in order to work. Listing 2 is not a complete story—it only shows nine "pages"—but it does illustrate several useful ideas.

First, for simplicity, you will find it helpful to think of your program in terms of pages just as if it were a printed book. Always begin each page on the line number equal to 100 times the page number, i.e., page one begins on line 100, page 13 begins on line 1300, etc.

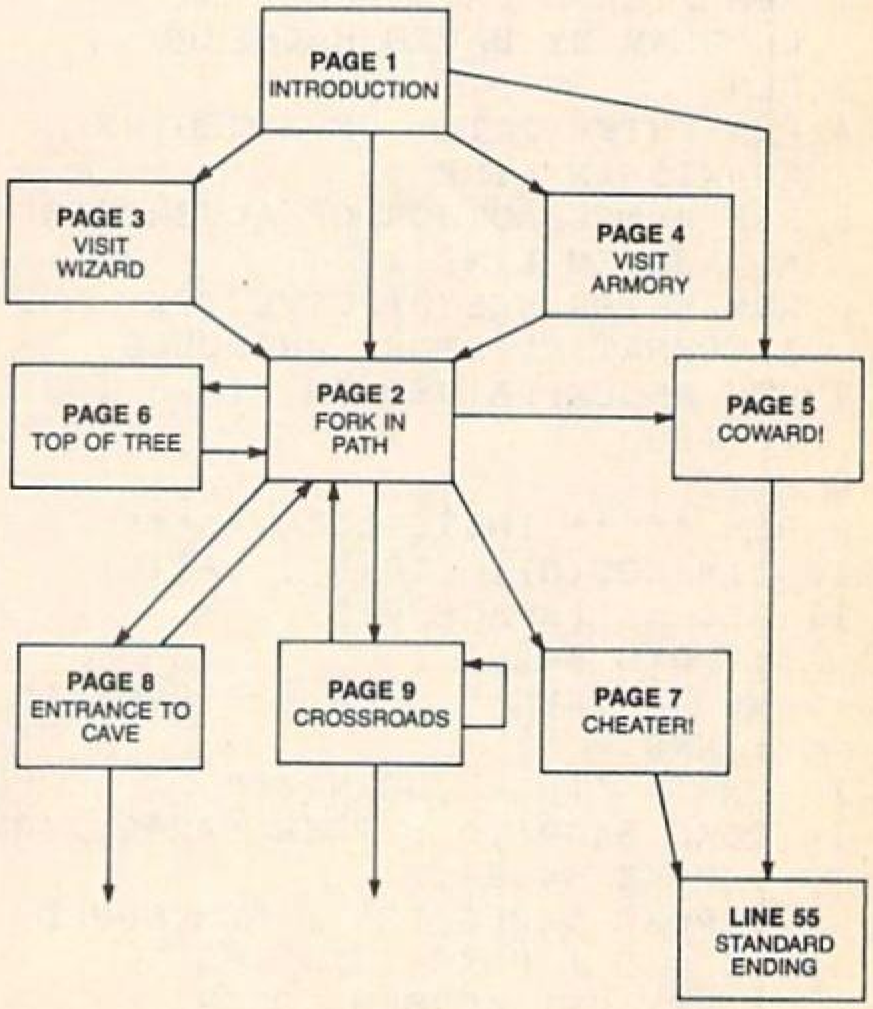
The Commodore 64 has plenty of memory to accommodate a well developed and even complex story. You will be able to write between 40 and 45 *full-screen* pages with three to five plot choices on each. If you have short pages, like page four in Listing 2, you will be able to build your adventure to over 200 pages. Regardless of your average page length, always eliminate unneeded lines or REMs as you go along so you won't be squeezed for room.

If you do not have any plot choices but just wish to continue the same episode on another page, use the commands shown in lines 360 to 370. Follow these commands with a GOTO to whatever page is next. For example, in line 380 the GOTO 200 jumps to page two.

As you develop your adventure, you will find it very helpful to draw a diagram of the various pages and where all of the choices lead. See the Figure 1 for a diagram that corresponds to Listing 2.

You will find it very useful to think of each page as either (1) a description of an event, (2) a location or (3) both an event and a location. For example, in Listing 2, page three is an event—an encounter with the wizard. Page eight is a location only—how you arrived at that location is not described. Page two is both an event (the description of the journey and some background on Furth's stronghold in lines 211 to 216) and a location (a fork in the path—line 218). If you have combination pages like two, it is a good idea to always have the description of the event first then the location. By keeping them separate, you will be able to use the location information again and again without having to create different pages. For example,

Figure 1. *Diagramming Your Choices*



after climbing the tree (page six), you return to the location part of page two by jumping to line 217 (in line 680).

The distinction between events and locations is the principal difference between "Choose Your Own Adventure" books and traditional computer adventure games like Scott Adams' *Adventureland* or *Pirate's Cove*. The books emphasize the description of events; the computerized adventures generally concentrate on locations (especially mazes). With the "Pick-A-Path" skeleton program, you should be able to construct the best of both worlds.

Start Writing!

The only thing about adventure games that is more fun than playing them is writing them. Writing adventures is very creative and provides some strenuous exercise for your brain muscles. It is especially satisfying when you surprise and/or amuse your friends and family with your very own stories.

There is only one excuse for not starting now: you can't think of a basic theme for your story. Well, here are a few ideas to get your literary juices flowing:

1. Write an adventure about yourself, your family, pets and friends. Describe the various locations in your neighborhood.
2. Describe Luke Skywalker's escape from the planet Qwerty after a crash landing.
3. Write about a boat trip through the Bermuda Triangle and your capture by pirates.
4. Help Sherlock Holmes solve the case of the giant rat from Sumatra that is terrorizing London's West End.
5. Explore an ancient lost African city and discover its secrets before being captured by savage natives.
6. Describe the key plays of next year's SuperBowl Football game. Write the adventure as if the player is coaching the underdogs.
7. Write about your covered wagon trip along the Oregon trail with your family.
8. Finish "Quest for the Firesword," the adventure begun in Listing 2.

Listing 1. Pick-A-Path Skeleton Program

```
1 REM ***** WRITE YOUR OWN
  "PICK-A-PATH" ADVENTURE *****
2 REM PICK-A-PATH SKELETON
  PROGRAM BY DAVID MALMBERG
3 REM
4 REM ENTER TITLE OF ADVENTURE
  AS XT$ IN LINE 65
5 REM ENTER AUTHOR OF ADVENTURE
  AS AU$ IN LINE 72
6 REM ENTER DESCRIPTIVE TEXT AND
  ALTERNATIVE STORY BRANCHES
7 REM AS EXPLAINED IN LINES 100
  TO 180
8 REM
9 REM ***** INITIALIZE *****
10 DIM AC$(6), FI$(6), LA$(6)
11 BL$ = "[SPACE39]"
   : POKE 54296,15
12 N$ = "[RVS]" : F$ = "[RVOFF]"
   : EM$ = ""
13 DN$ = "[HOME,DOWN24]"
14 POKE 54291,0 : POKE 54292,240
   : POKE 54290,17
   : POKE 54286,126 : REM SOUND
15 CS = 9 : POKE 53281,CS
   : REM SET SCREEN COLOR
16 CB = 9 : POKE 53280,CB
   : REM SET BORDER COLOR
17 CP = 7 : POKE 646,CP
   :REM SET PRINT COLOR
18 GOTO 65 :REM GOTO TITLE AND
   INSTURCTIONS
19 REM ***** COMMON SUBROUTINES
   *****
20 REM
21 REM DISPLAY POSSIBLE CHOICES
   AND GET SELECTION
22 PRINT : PRINT"MAKE YOUR CHOICE
   :"
23 PRINT : FI$(1) = N$
   : LA$(1) = F$ : BR = 1
24 FOR I = 2 TO NU
   : FI$(I) = EM$ : LA$(I) = EM$
   : NEXT
25 FOR I = 1 TO NU
26 PRINT FI$(I);AC$(I);LA$(I)
27 NEXT : PRINT LEFT$("[UP10]",
   NU+1)
28 GET A$ : IF A$ = EM$ THEN 28
29 IF A$ <> CHR$(133) THEN 33
   : REM TEST FOR F1
30 REM CHANGE SCREEN COLOR
31 CS = (CS + 1)AND 15
   : IF CS = CP THEN 31
32 POKE 53281,CS : GOTO 28
33 IF A$ <> CHR$(134) THEN 37
```

```
   : REM TEST FOR F3
34 REM CHANGE BORDER COLOR
35 CB = (CB + 1)AND 15
36 POKE 53280,CB : GOTO 28
37 IF A$ <> CHR$(135) THEN 41
   : REM TEST FOR F5
38 REM CHANGE PRINT COLOR
39 CP = (CP + 1)AND 15
   : IF CP = CS THEN 39
40 POKE 646,CP : GOTO 25
41 IF A$ <> CHR$(17) THEN 47
   : REM TEST FOR CURSOR DOWN
42 REM MOVE REVERSE-PRINT TO
   NEXT CHOICE
43 NE = BR + 1 : IF NE > NU THEN
   NE = 1
44 FI$(BR) = EM$ : LA$(BR) = EM$
45 FI$(NE) = N$ : LA$(NE) = F$
46 BR = NE : GOTO 25
47 IF A$ <> CHR$(13) THEN 28
48 RETURN : REM CHOICE SELECTED
   IS CURRENT BRANCH (I.E., BR)
49 REM
50 REM ***** CENTER MESSAGE *****
51 LL = LEN(ME$) : IF LL > 39
   THEN RETURN
52 ME$ = LEFT$(BL$,
   INT((40 - LL)/2)) + ME$
   : RETURN
53 REM
54 REM ***** STANDARD ENDING
   SUBROUTINE *****
55 NU = 2 : PRINT : PRINT"
   [SPACE16,RVS]THE END[RVOFF]"
56 AC$(1) = "PLAY AGAIN"
   : AC$(2) = "QUIT PLAYING"
57 IF SC <> 0 THEN PRINT
   : PRINT"YOUR FINAL SCORE IS ";
   SC
58 GOSUB 22
59 IF BR = 1 THEN 97
60 PRINT"[CLEAR]THANKS FOR
   PLAYING!!" : END
61 REM
62 REM ***** STANDARD TITLE
   ROUTINE *****
63 REM ***** ENTER TITLE BELOW
   AS XT$ *****
64 REM ***** DON'T HAVE ANY
   UNNECESSARY SPACES IN TITLE
   *****
65 XT$ = "PICK-A-PATH ADVENTURE
   SKELETON"
```

```
66 XT$ = N$ + XT$ + F$
   : ME$ = XT$ : GOSUB 51
67 XT$ = ME$ : PRINT"[CLEAR]"
68 FOR I = 24 TO 4 STEP -1
   : PRINT LEFT$(DN$,I);XT$
   :PRINT BL$ : POKE 54287,I*9
69 NEXT
70 REM ***** ENTER AUTHOR'S NAME
   BELOW AS AU$ *****
71 REM ***** DON'T HAVE ANY
   UNNECESSARY SPACES IN NAME
   *****
72 AU$ = "DAVID MALMBERG"
73 ME$ = "BY " + AU$ : GOSUB 51
   : AU$ = ME$
74 FOR I = 24 TO 6 STEP -1
   : PRINT LEFT$(DN$,I);AU$
   :PRINT BL$ : POKE 54287,I*9
75 NEXT : POKE 54296,0 : TT = TI
76 IF TI - TT < 300 THEN 76
77 REM
78 REM ***** STANDARD
   INSTRUCTIONS *****
79 PRINT"[CLEAR]";XTITLE$ : PRINT
80 PRINT"IN THIS PICK-A-PATH
   ADVENTURE, YOU WILL
81 PRINT"DECIDE WHAT HAPPENS AND
   HOW THE STORY
82 PRINT"ENDS.[SPACE2]
   AS THE STORY UNFOLDS, YOU WILL
83 PRINT"BE PRESENTED WITH
   VARIOUS ALTERNATIVE
84 PRINT"ACTIONS YOU CAN TAKE.
   [SPACE2]YOUR CHOICES
85 PRINT"DETERMINE EVERY TWIST
   AND TURN OF THE
86 PRINT"PLOT.
87 PRINT : PRINT"WHENEVER YOU
   SEE ALTERNATIVE STORY
88 PRINT"PATHS, YOU MAY USE THE
   FOLLOWING KEYS
89 PRINT"TO CONTROL HOW THE
   STORY MOVES:
90 NU = 5 : PRINT LEFT$(DN$,
   24)"GO AHEAD AND TRY THESE
   KEYS"
91 AC$(1) = "CURSOR DOWN - MOVES
   TO NEXT CHOICE"
92 AC$(2) = "RETURN - SELECTS
   CURRENT CHOICE"
93 AC$(3) = "F1 - CHANGES THE
   SCREEN COLOR"
94 AC$(4) = "F3 - CHANGES THE
```

(Continued On Page 78)

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Pick-A-Path

(Continued From Page 77)

```
   BORDER COLOR"
95 AC$(5) = "F5 - CHANGES THE
   PRINT COLOR"
96 PRINT LEFT$(DN$,13) : GOSUB 23
97 SC = 0 : REM INITIAL SCORE
98 REM NOW BEGIN STORY WITH
   FIRST PAGE
99 REM
100 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 1 ON LINE 100,
     PAGE 2 ON LINE 200, ETC.
102 REM ***** ENTER STORY PART
    BELOW *****
103 REM ***** INSIDE THE QUOTE
    MARKS *****
104 REM DELETE UNUSED STORY LINE
    NUMBERS
111 PRINT"[SPACE39]"
112 PRINT"[SPACE39]"
113 PRINT"[SPACE39]"
114 PRINT"[SPACE39]"
115 PRINT"[SPACE39]"
116 PRINT"[SPACE39]"
117 PRINT"[SPACE39]"
118 PRINT"[SPACE39]"
119 PRINT"[SPACE39]"
120 PRINT"[SPACE39]"
121 PRINT"[SPACE39]"
122 PRINT"[SPACE39]"
123 PRINT"[SPACE39]"
124 PRINT"[SPACE39]"
150 REM ***** ENTER YOUR STORY
    CHOICES BELOW *****
151 REM ***** PUT CLOSING QUOTE
    MARK AFTER EACH CHOICE *****
152 REM DELETE THE LINE NUMBERS
    FOR ANY UNUSED CHOICES
153 REM ADJUST NU TO NUMBER OF
    CHOICES POSSIBLE
160 NU = 5 : REM SETS NUMBER OF
    CHOICES
161 AC$(1) = "
162 AC$(2) = "
163 AC$(3) = "
164 AC$(4) = "
165 AC$(5) = "
170 GOSUB 22 : REM GET SELECTED
    CHOICE NUMBER (BR)
180 ON BR GOTO 200,300,400,500,
    600 : REM BRANCH ACCORDINGLY
```

Listing 2. Sample Segment

```
1 REM ***** JUST A SAMPLE
  SEGMENT OF AN ADVENTURE *****
2 REM MUST BE COMBINED WITH
  LISTING 1 TO RUN
3 REM
100 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 1
111 PRINT"IT IS A TIME OF MAGIC,
     OF DEMONS AND[SPACE3]"
112 PRINT"DRAGONS.[SPACE2]
    IT IS A TIME FOR COURAGE AND
    "
113 PRINT"CUNNING.[SPACE2]
    IT IS A TIME OF ADVENTURE!
    [SPACE3]"
114 PRINT"THE ANCIENT FIRESWORD
    HAS BEEN STOLEN[SPACE2]"
115 PRINT"BY THE EVIL SORCERER
    FURTH.[SPACE2]THE FIRE- "
116 PRINT"SWORD IS A MAGIC
    WEAPON OF IMMENSE[SPACE5]"
117 PRINT"POWER AND WHOEVER
    HOLDS THAT POWER CAN "
118 PRINT"RULE THE KINGDOM.
    [SPACE2]IN THE WRONG HANDS, "
119 PRINT"THE FIRESWORD CAN
    BRING SLAVERY AND[SPACE4]"
120 PRINT"DEATH TO THE PEOPLE.
    [SPACE2]IF RETURNED TO
    [SPACE3]"
121 PRINT"THE KING,
     THE FIRESWORD CAN ASSURE
    JOY "
122 PRINT"AND PEACE IN THE LAND.
    [SPACE17]"
123 PRINT
124 PRINT"THE KING HAS ASKED YOU
    TO RESCUE THE[SPACE3]"
125 PRINT"FIRESWORD BEFORE IT IS
    USED FOR EVIL.[SPACE2]"
160 NU = 4
161 AC$(1) = "START YOUR QUEST"
162 AC$(2) = "CONSULT THE WIZARD"
163 AC$(3) = "VISIT THE ARMORY"
164 AC$(4) = "DECLINE THE KING'S
    REQUEST"
170 GOSUB 22
180 ON BR GOTO 200,300,400,500
200 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 2
211 PRINT"AFTER A THREE DAY
    JOURNEY, YOU ARRIVE[SPACE2]"
212 PRINT"AT THE EDGE OF A DARK
    FOREST.[SPACE2]FURTH'S "
213 PRINT"STRONGHOLD IS RUMMORED
    TO BE WITHIN THE"
214 PRINT"FOREST.[SPACE2]
    IT IS ONLY A RUMOR SINCE NO
    [SPACE3]"
215 PRINT"ONE HAS EVER FOUND THE
    STONGHOLD AND[SPACE3]"
216 PRINT"LIVED TO TELL ABOUT
    IT.[SPACE16]"
217 PRINT
218 PRINT"YOU ARE AT A FORK IN
    THE PATH.[SPACE9]"
260 NU = 5
261 AC$(1) = "CLIMB A TREE FOR A
    BETTER VIEW"
262 AC$(2) = "USE YOUR MAGIC
    CARPET"
263 AC$(3) = "TAKE THE RIGHT
    PATH"
264 AC$(4) = "TAKE THE LEFT PATH"
265 AC$(5) = "RETURN TO THE
    PALACE"
270 GOSUB 22
280 ON BR GOTO 600,700,800,900,
    500
300 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 3
311 PRINT"THE WIZARD SAYS,
     'YOUR CAUSE IS JUST,[SPACE2]
    "
312 PRINT"BUT FURTH'S POWERS ARE
    GREAT.[SPACE2]TAKE THE"
313 PRINT"RING; IT WILL ENABLE
    YOU TO CAST SPELLS"
314 PRINT"OF DESTRUCTION ON YOUR
    ENEMIES.'[SPACE7]"
315 PRINT
316 PRINT"AN IMAGE OF A CAVE
    APPEARS IN THE[SPACE6]"
317 PRINT"WIZARD'S BOILING
    CALDRON AND THE WIZARD"
318 PRINT"CRYS, 'DON'T GO IN THE
    CAVE!'[SPACE10]"
360 NU = 1
361 AC$(1) = "PRESS RETURN TO
    CONTINUE"
370 GOSUB 23
380 GOTO 200
```

(Continued On Page 80)

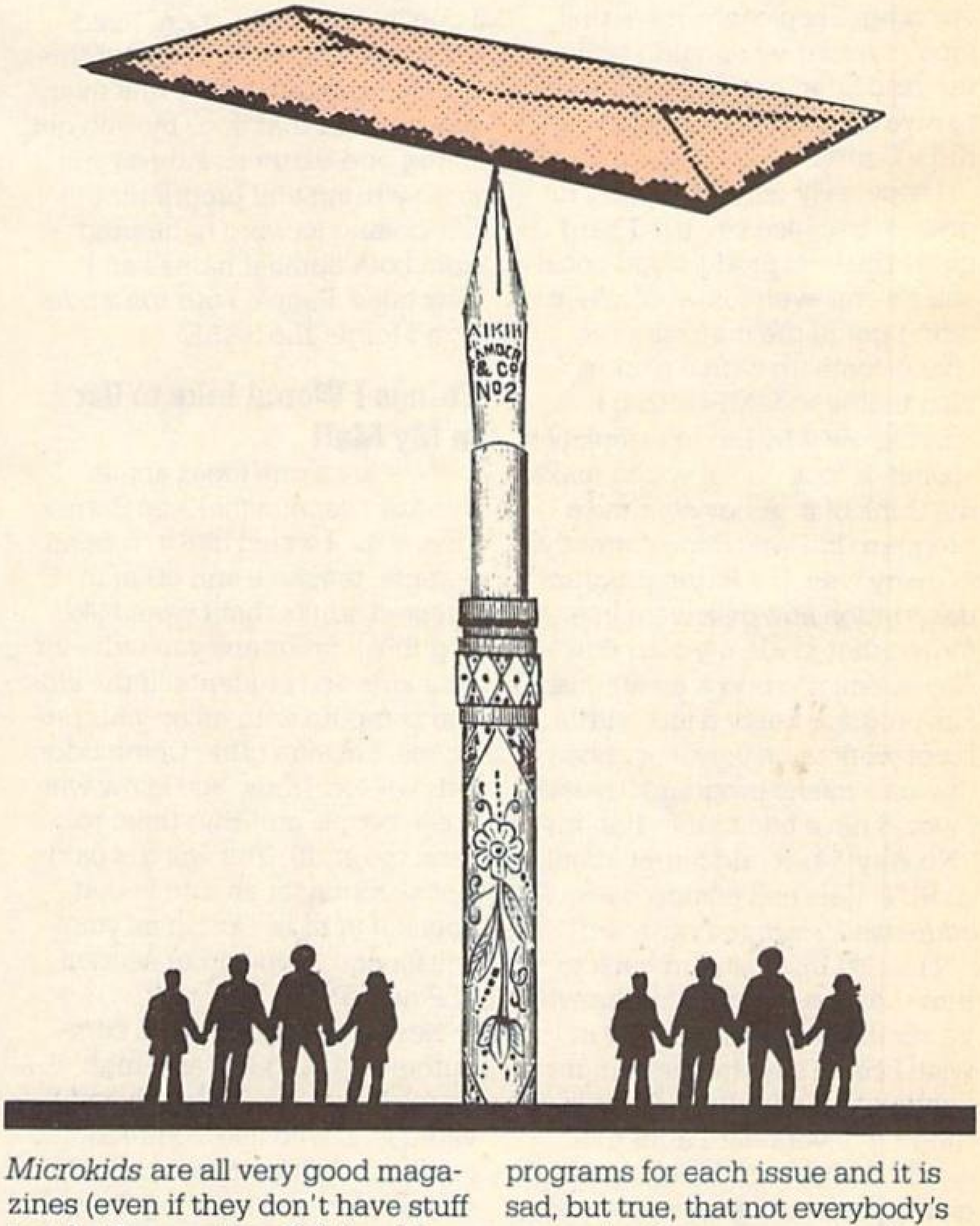
Pick-A-Path *(Continued From Page 79)*

```
400 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 4
411 PRINT"YOU EQUIP YOURSELF
    WITH A SHIELD AND A "
412 PRINT"SHARP SWORD.[SPACE2]
    READY FOR ANYTHING, YOU
    [SPACE2]"
413 PRINT"BEGIN YOUR QUEST.
    [SPACE22]"
480 GOTO 360
500 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 5
505 SC=-1000
511 PRINT"YOU SHAMELESS COWARD!
    [SPACE18]"
512 PRINT
513 PRINT"BECAUSE OF YOUR
    FAILURE, FURTH WAS ABLE"
514 PRINT"TO USE THE FIRESWORD'S
    POWER FOR HIS[SPACE3]"
515 PRINT"EVIL DEEDS.[SPACE2]
    THE PEOPLE OF THE KINGDOM "
516 PRINT"WERE ENSLAVED AND
    SORROW FILLED THE[SPACE4]"
517 PRINT"LAND.[SPACE34]"
580 GOTO 55
600 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 6
611 PRINT"YOU CLIMB UP TO THE
    TOP OF A VERY TALL "
612 PRINT"TREE.[SPACE2]
    THE FOREST IS SO THICK THAT
    YOU "
613 PRINT"CANNOT SEE ANYTHING
    EXCEPT MORE TREES. "
614 PRINT
615 PRINT"DISAPPOINTED,
     YOU CLIMB DOWN.[SPACE10]"
680 GOTO 217
700 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 7
705 SC=-1000000
711 PRINT"YOU ROTTEN CHEATER!!!
    [SPACE18]"
712 PRINT
713 PRINT"YOU DON'T HAVE A MAGIC
    CARPET![SPACE9]"
780 GOTO 55
800 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 8
811 PRINT"YOU ARE BY THE
    ENTRANCE TO A DARK CAVE."
812 PRINT"YOU CAN GO NORTH,
     SOUTH OR EAST.[SPACE7]"
860 NU = 4
861 AC$(1) = "EXPLORE THE CAVE"
862 AC$(2) = "FOLLOW THE NORTH
    PATH"
863 AC$(3) = "FOLLOW THE SOUTH
    PATH"
864 AC$(4) = "FOLLOW THE EAST
    PATH"
870 GOSUB 22
880 ON BR GOTO 1000,1100,890,900
890 PRINT "[CLEAR]";XT$
    : GOTO 217
900 PRINT "[CLEAR]";XT$ : PRINT
    : REM PAGE 9
911 PRINT"YOU ARE AT A
    CROSSROADS.[SPACE2]
    YOU CAN GO[SPACE3]"
912 PRINT"NORTH, SOUTH,
     EAST OR WEST.[SPACE12]"
960 NU = 4
961 AC$(1) = "FOLLOW THE NORTH
    PATH"
962 AC$(2) = "FOLLOW THE SOUTH
    PATH"
963 AC$(3) = "FOLLOW THE EAST
    PATH"
964 AC$(4) = "FOLLOW THE WEST
    PATH"
970 GOSUB 22
980 ON BR GOTO 1200,890,900,800
1000 REM
1001 REM ***** NEEDS ADDITIONAL
     STATEMENTS TO BE COMPLETE
     *****
```

C

Dear Kids

By Betsy Byrne



I just *had* to write and tell you what a good job you are doing keeping me supplied with quality programs, articles and drawings for Kids' Corner. When I started your section in *Power/Play* over a year ago, quite a few adults were skeptical that it would never get off the ground. I heard advice like: "You will never make it. Kids will just send an incredible amount of junk and you will have to write everything yourself." Or "You can't print things that aren't state-of-the-art or useful just because they were written by kids." (I've never had to think about doing that.)

Just to be fair, I have to say that many adults also gave me lots of encouragement, ideas and support —especially the other people involved in making *Power/Play* —and I hope all of them will be as happy as I am that we showed them they were right and the other people were wrong.

An important thing for you to know is that I get calls from adults who enjoy reading your articles and typing in (and learning from) your programs. Even from some of the adults who thought Kids' Corner would never work. And now there are *lots* of kids' computer magazines that work out just as well as Kids' Corner has and they have kids writing for them, too. *Enter, K Power* and *Microkids* are all very good magazines (even if they don't have stuff just for Commodore Kids) and I recommend them highly.

I have a special message for the kids who have sent me stuff that has not been put in the magazine. I don't want you to think that because I didn't use your contribution that it wasn't any good or that you aren't a good programmer. It's very hard to choose the programs for each issue and it is sad, but true, that not everybody's can go in. Some reasons don't even have anything to do with how good it is! It might be too long or too much like something that was just published in another section of the magazine or in another magazine. It might have failed to load when I tried it. You may not have included enough "user friendly" prompts and I just didn't have time to add them.

But there is something very special about each one of you who had enough *initiative* to send something in. *Initiative* means that you believed in yourself enough to send it in and had the courage to face the fact that it might not be printed, even after all your work and all your finger-crossing. People who have this kind of *initiative* shouldn't give up. And I don't want any of you to give up sending things to Kid's Corner.

I especially don't want you to give up because you tried hard, made the best product you could and no one even told you *why* it didn't get in the magazine, so I have come up with a plan. A plan that is so SIMPLE that I don't know why I didn't think of it sooner. It took one of you to make me think of it. A boy sent me a program that was done correctly in every way. His letter, program description and disk were in a format that made my own *Power/Play* submissions look amateurish. His program needed just a little bit of work to be very, very good (it was a music program). Usually I would have had to toss it in my "No Way!" box and forget about it. BUT... he had enclosed a *self-addressed, stamped postcard*!

I mailed his postcard back to him the next day, explaining what he should do and how to do it. I wish I could say that he sent me another copy right away but he didn't. I never heard from him again. But at least I tried. And it gave me a chance to see how all of you felt not getting an answer. Sometimes your programs need a little more this or a bit less that. If you send me a SASE, maybe I can tell you what to try next time and at least you will know that your stuff got here!

If you already sent something in that I didn't use, why not take a chance and try again, with some improvements or something new? All of us who write for magazines sometimes get our work turned down. It doesn't *ever* not hurt, but if we had stopped sending things we would never have become writers. And if everybody gave up, pretty soon there would be no more books or magazines. Look at the things I publish in your section. Read other magazines, and reread this article. And remember that every day or week that goes by, you get better and better as long as you keep writing and programming. I'm looking forward to hearing from both familiar names and new ones. People with *initiative*. Don't forget the SASE.

Things I Would Like to Get in My Mail

Here are some ideas about things to send in for Kids' Corner. First of all, I would like to remind parents, teachers and other interested adults that I would like to publish programs you write for your kids and students. If the kids you compute with enjoy your programs, I'm sure other Commodore kids will too. (*Kids:* You know who these people are! Bug them to send me stuff!) You will get paid just as much for an article that appears in Kids' Corner as you will for one in any other section of *Power/Play*.

Neat ideas about using computers with kids are also high on my list. Even the highly motivated kids who use Commodores can benefit from ideas that help make using and learning about their computers more interesting. Don't stop reading here, every thing I am going to say to the kids applies to you also—this is one place where there is very little difference between kids and grownups. That is just one of the exciting things technology has made happen!

There's nothing like a Commodore to make homework and schoolwork less boring and if you have made any neat programs to make your life easier—please share them with the rest of us. Maybe you have learned some tricks that you put into subroutines—nothing earthshaking but certainly something to be proud of. Send in one or put together several—you can bet that someone somewhere will be eternally grateful!

So you don't like to program. Or you are just learning and have a million questions. Send in the whole million in the format of a letter telling about your personal experiences trying to learn the computer's ungrammatical language. Write me a review of your favorite software, but I'm warning you—it has to be well written or I won't publish it. We don't just want to hear that it's good or bad; we need to know why. Again, include some personal experiences like: "The xxx wordprocessor is driving me crazy! It is so easy to use that even an adult can do it. I showed it to my Mom and now she has decided to write a novel. Help! She never lets me use my computer anymore!" Or, "Whizz Bang is a superfast machine language game with terrific graphics and 1,459 levels. I can only vouch for level one, which is as far as I have been able to get in 2 years, thanks to the speed of its machine language."

If in doubt, ask your English teacher for some rules for book reports. Just write like you were telling your best computer-owning friend about it and it's sure to turn out well. There is no longer any restriction about whose products you can mention. Epyx and Infocom are fair game, as well as Commodore. You will find more ideas (and directions for formatting and mailing) in "How to Submit Things", which appears in Kids' Corner each issue. C

Kids, Commodores, and— ROBOTS!

By Betsy Byrne

TOPO gets a hug from associate editor, Betsy Byrne.

Something exciting happened in Albuquerque, New Mexico, recently. Something fun, educational and a little bit awesome. I live in Albuquerque and I can tell you that exciting, awesome things don't happen here every day—or even every month. Unlike New York, Chicago or even Detroit (where I grew up), we sometimes have to wait months or years for new developments to filter through to us. We don't mind since it *is* a great place to live. But it *was* nice for a change to be in on the beginning of something that may, someday soon, rock the very foundations of the American way of life. Personal robotics. That's right, robots for personal people, people like you and me. Robots for families, kids, butchers, bakers, joystick makers and Indian chieftans. Albuquerqueans played host to the first annual International Personal Robotics Congress and Exposition and those who attended will never again think of robots as science fiction stereotypes or of robotics as the science of replacing people with machines on industrial assembly lines.

My love affair with robots began almost a year ago when a personable little fellow named TOPO came to live with my family. Although he didn't *do* much and left after a few months, I never quite stopped thinking and dreaming about robots after working with and writing about TOPO. Keeping this in mind, you can imagine my excitement when I entered the convention center and found myself surrounded by personal robots of all shapes and sizes who were showing off an amazing variety of fascinating skills and abilities for conference attendees.

I saw robots acting as lawnmowers, butlers, night watchmen and household pets. I was a bit unnerved (but intrigued) to be introduced to "bits and pieces" of robots—arms, eyes and ears (cameras, sonar and infrared), robotic "nervous systems" (sensor readers and control interfaces) and wheeled devices meant to serve as robot "legs"—to mention just a few.

Almost as interesting as the robots themselves were their creators and the robot *aficionados*. Many of these humans were famous in their own right as inventors, authors, computer hardware and software developers, publishers and educators. The hall and the list of scheduled speakers was filled with movers and shakers of the high tech world of personal computers and robotics.

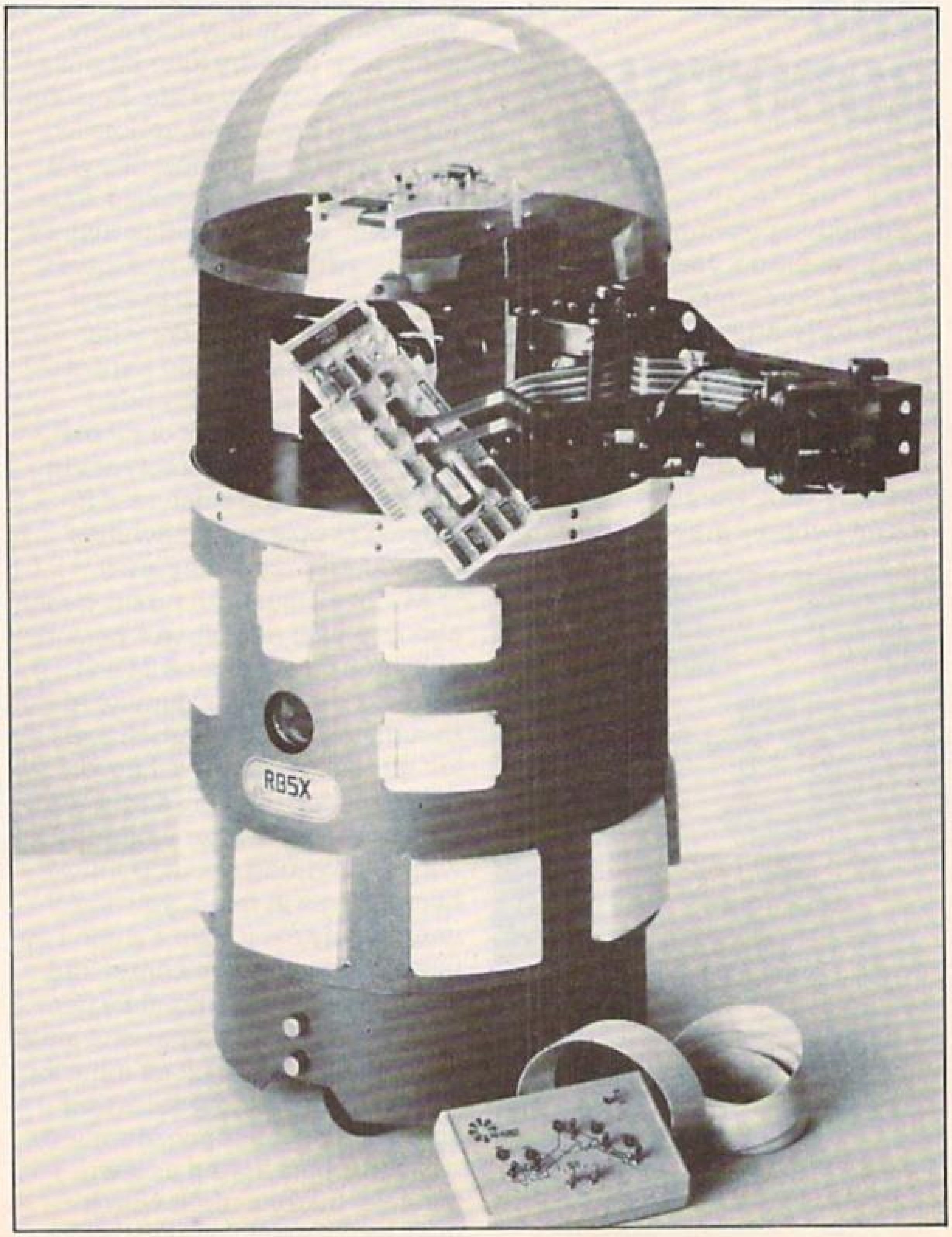
Everywhere I looked, the children of Albuquerque were coming to meet the wonderful servants and companions that the future holds in store for their generation. Parents, for the most part, stood back. Like most of their generation, they were a bit awed and overwhelmed by the magic of high technology—but the children recognized their heritage and lost no time worrying about past or future. They wheedled robot rides and held animated conversation with robots equipped with speech options. Seven year-olds played math games with one engaging little being and were rewarded with robotic art for their skills. Across the way, a teenager snapped his fingers to activate a mobile robot no larger than a Guinea pig—then dug into tight jeans and counted out crumpled bills to purchase the little guy in kit form. His mother laughingly approved, saying, "At least I won't have to feed it or clean its cage!".

At the same booth, computer literate youngsters programmed a transparent "turtle" robot that was controlled by the LOGO learning language. They typed commands like: TRT 90 (turtle right 90 degrees) and TFD 100 (turtle forward 100 steps). While the robot gyrated in complex trapezoidal patterns—gears madly turning and whirring inside its handsome, transparent body—a small turtle cousin duplicated his path on the computer's screen, creating a pleasing geometric design.

Commodore kids were drawn like magnets to the sight of a VIC 20 and a C64 controlling an unruly host of small, inexpensive educational and hobby robots. The company Spectron (also known appropriately as "Hobby Robots") showed robots that crawled, picked up pegs or blocks and played checkers. One even peered at onlookers with red eyes that conveyed information to the 64, which mapped it with asterisks on the monitor screen. The program that accomplished this was only nine lines long!

On the other side of the hall, personal robot developers (PRDs) were enthroned in authentic looking robotic workshops. They tirelessly put their creations through their paces, both for the enthralled spectators and for a panel of distinguished robotics judges. They displayed robotic fire extinguishers, chess players, and even a robotic balloonist who was created to carry much needed sensors and detectors up vertical ladders in suspect nuclear powerplants—going where no human would dare to tread. All these and more competed for coveted "Golden Droid" awards in three categories: Most Useful (won by the robotic law mower); Most Entertaining (captured by Zylatron, a sensor-laden household robot with a Timex/Sinclair 1000 for a brain); and Open (awarded to a little guy with a new type of wheel design). I would hate to think that the fire extinguisher robot lost because he wet on the leg of a distinguished judge (a famous science fiction author)—but as any dog show attendee will tell you, manners *do* count!

When appetites for new adventure in robotic hardware became (temporarily) sated and wonder sensors signalled OVERLOAD, kids and parents alike drifted to the booths inhabited by the publishers of robotics magazines and newsletters. Well-known slicks *Omni* and *Robotics Age* rubbed shoulders with the robotics trade press. I counted no less than xx robotics newsletters and one interesting newcomer to the field. The publisher of *Personal Robotics Magazine* is Tim Knight, an 18 year-old whose



RB5X from RB Robot Corporation is fully programmable.

name may be new to the publishing field but who has more than 15 book titles to his name including 32 BASIC home application programs for the Commodore 64. Tim's company gave away sample copies of *PRM*, signed up subscribers and conversed learnedly on the pros and cons of anything robotic no differently than all the other publications there (see More Robot Information for a list of robotic publications).

Of course the "Big Three" personal robots were there. Yes indeed, the infant industry already has its own equivalent Ford, General Motors and Chrysler—or Commodore, Apple and IBM. The companies are Androbot, RB Robot and the Heath Company. Their products are (respectively) TOPO and B.O.B., RB5X and HERO—robots of distinction designed for the same home/hobby/education/business market that so recently brought wealth and acclaim to the personal computer industry. In fact, I'm not so sure that at this point in their development any of these robots can actually be separated from the home computer market since all of them are designed to interact with computers to some degree. For example, TOPO is unable to run without one.

The big news (to my way of thinking) at all three booths was that the Commodore 64 is the computer of the hour. Of course, this is hardly news to any Commodore owner (over one million of us), but in an industry where the computer of choice has seemed to be the Apple, it was very refreshing to hear robot representatives laud the abilities of their products on the "powerful Commodore 64."

RB Robot's RB5X

The robot that *looks* like everyone's idea of a personal robot is RB Robot's RB5X. Resembling Star War's R2D2, this slow-moving fellow with a rounded, transparent dome for a head may be the most versatile of the four. With the Commodore 64, he can be programmed in Tiny BASIC, which is then downloaded to him through the Commodore RS232 interface and a cable. This procedure works a lot like sending a program over the modem to a friend (RB seems like a friend immediately) with a different type of computer, since RB5X has an INS 8073 processor onboard.

Billing RB5X as "the perfect addition to any family" and "a versatile multipurpose home appliance," RB's ad copy does a masterful job—helping the little robot work his way into both the homes and the hearts of the technologically aware American family. If they can afford him! None of the "Big Three" companies market an inexpensive product (see chart)—RB5X base units cost $2,295.00. The base unit does NOT include either RB's arm or voice synthesis system, both of which are necessary to make RB perform his most useful and interesting jobs. He does boast both tactile (touch) and sonar sensors onboard—making him aware of his environment and able to use special programs to explore and "learn" about his environment and will find his charger and plug himself in when his charge gets low!

There were several companies displaying products that they had designed for RB, including a voice recognition system. Much of my RB5X information was garnered from RB's $19.95 Robot Appreciation Kit, a wonderful package that includes everything you ever wanted to know about robots, including an Issac Asimov book of robot short stories and the RB5X manual, less technical appendices. RB5X add-ons include: arm, voice, 16K RAM, power pack, and three program ROMs, as of this writing.

HERO: A Do-It-Yourself Robot From Heath

The Heath robot, HERO, is another kettle of fish entirely! It is designed to be assembled from a kit (although he CAN come assembled). Heath Kit computers were also one of the first personal computers on the market and were also offered in kit form. Heath has not themselves provided an interface for the HERO and the Commodore 64, but they were eager to tell me (and the other members of the press) that another company has one available in the form of a board that replaces one already resident deep inside HERO. Once this substitution has been made, the Commodore RS232 interface is again the line of communication between you and your robot. He doesn't really need *any* computer however—he has a keypad on the top of his head that allows program entry in machine language—if you are up to it. Working arm, voice, sensors and sound and motion detectors are all part of the package with HERO, making his $1,199 price tag ($2,199 assembled) very attractive as compared with RB5X. This is particularly good for enthusiasts with electronics and soldering skills, and those with 40 to 80 hours of time uncluttered enough to put the little guy together.

HERO was the first of the robots to be marketed and there have probably been more HERO's sold than any other robot discussed here. If you can get him put together, he is a very useful robot indeed. He has excellent credentials as a night watchmen and can even serve as a mobile alarm clock and appointment prompter (all around nag). His speech is programmed with phonemes so he can speak in any language and there is a large support net available in HUG, the nation wide Heath user organization. HUG publishes articles about and programs for HERO in each issue of their (professional quality) magazine.

B.O.B. and TOPO: Handsome and Helpful Androbots

Last, but in my opinion far from least, of the "Big Three" companies is Androbot. The most humanlike robots in appearance (hence the name Androbot), B.O.B. and TOPO have attractive molded plastic heads that make me feel that there is really a chance that it *isn't* all done with computer programming. B.O.B. is the fellow who is really designed to compete with RB5X and HERO. He differs radically from the other two in ways other than his looks, which are handsome as well as utilitarian. He is taller, stronger and seems to be able to move faster. He has a "lift" rather than the gripper-equipped arm that HERO and RB use, similar in concept to that of a forklift truck.

B.O.B.
He's a
rammable
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himself

Androbot's B.O.B. performs a card trick.

B.O.B. can lift 18 to 22 pounds —compared to about one pound for the other two. For $3995, this rugged robot comes with an on-board 8088 processor expandable to 640K.

B.O.B. stands for Brains On Board, of course—he has four ultrasonic sensors, a bar code reader, a magnetic compass (!) so he always knows where he is, and a comprehensive speech system: speech board, speaker and speech ROM with a 157-phrase vocabulary and text-to-speech capability. His speech is very understandable, due to the preprogrammed phrases, much like a male version of Commodore's *Magic Voice*.

Crowds around the Androbot booth watched B.O.B. pick up a six-pack of bottles on a low table and deliver it to his operator (...master? trainer?). He then performed card tricks, showing

What Can It Do?

By Betsy Byrne

"What are they good for?" "What will they really DO?" These questions were on everyone's mind at the first International Personal Robotics Conference, so I set out to find some answers for all the folk who would LOVE to have a personal robot, if only they knew what to do with it—myself included.

The most obvious answer, of course, is education. Just as we bought personal computers in the seventies and early eighties to learn about computers and electronics, we will be buying personal robots in the middle and late eighties to learn about robotics and computers. Since most of the major brands of robots are designed to interact with personal computers like the Commodore 64, a robot can be a great motivator for both children and adults to learn about computers and artificial intelligence concepts. As I attended some of the IPRC seminars, however, I found that robots are already doing much more than I had ever dreamed possible—right now in 1984.

The most impressive presentation I sat in on was set up around the use of robots in human services. I saw a slide show presented by Larry Leifer and K.G. Englehart from the Palo Alto California Veterans Administration Hospital, that, frankly, knocked me for a loop. I saw robotic arms, under voice recognition control, enabling quadriplegic or totally paralyzed people to do things that are very easy for you and me, but absolutely impossible for them to accomplish alone. Things like getting a drink of water. Things like preparing and cooking a meal. I actually saw a robotic arm light a gas stove, shake out the match, and place it in an ashtray. It put food in a microwave, timed it, and took it out again. There was even a video demonstration showing a class of students who programmed the arm to make PANCAKES. Of course, this kind of stuff is only experimental and the hardware, software, and equipment costs (roughly) $70,000. But, as soon as every handicapped person who could use one, gets one—I hope to be next on the list! The Human Services Seminar also presented a very convincing argument for robots as nursing home helpers. No $70,000 needed here, any of the "Big Three" personal robots (described in the main article) can accomplish the kinds of fetch and carry or monitoring tasks that eat up time in hospitals and nursing homes, time now wasted by skilled nursing personnel who are badly needed to perform more important duties.

TOPO vs. Fido

Speaking of fetch and carry, one of the most talked about events of the IPRC was a press conference given early one morning by Nolan Bushnell, Chairman of the Board of Androbot. Bushnell managed to spark the interest of the audience when he suggested that personal robots might replace the family pet. Consider all the children and adults who are unable to own pets, either because they have severe allergic reactions to furry creatures or because pets are banned in the area where they live. There has been quite a lot of research done recently, studies that have shown that people live happier, healthier, longer lives when given a pet to care for—and from the robot/people interactions I observed at IPRC, robots might well make a very good alternative to a dog, cat, or bird.

While Bushnell is projecting that robots may replace the family pet in American households, RB Robot has a different idea. In their Robot Appreciation Kit, RB says that THEIR robot, RB5X, may be programmed as a sort of pet "companion or caretaker." In my opinion, this would be a boon to any working pet owner who has suffered the agonies of guilt that can come with leaving a beloved pet at home alone all day. Or the other kinds of agonies off his bar code reading skills… nothing up *his* sleeve. The people loved it. But bar code reading is good for much more than card tricks. By simply labelling areas and things in your home you could be able to send B.O.B. anywhere—to do anything he is capable of—he would always know where he was. Along with the usual security system tasks, and being a child's friend and companion, I can visualize B.O.B. (equipped with his lift) helping take out the garbage or, as in the movie "Silent Running," carrying my potting soil or tools as I work in my greenhouse.

Kids at the robotics show play with tiny Movits robots.

Nolan Bushnell, well-known entrepreneur, founder of Atari and chairman of the board of Androbot says, "Robots give people the perfect opportunity to have slaves without guilt."

I have to disagree a bit with his choice of words, mainly because they make me feel guilty already. If what robots do is slavery, then there are five slaves at my house: my husband and four children! I would rather feel that, as Fred d'Ignazio so aptly puts it, "Robots will be our friends, companions, and willing servants, acting as personal secretaries and even household pets."

TOPO has often been described as B.O.B.'s younger brother, though in point of fact, a version of TOPO has been on the market for over a year. The first version didn't do much in the way of being a household robot, as I have already mentioned. But as an educational robot, TOPO was without peer and he could motivate people to learn about computers who had previously been lifelong computer-phobes. As a computer accessory, he was very reasonably priced at $400 or so.

Early this year, a new version of TOPO, TOPO II, was released and he incorporated quite a bit of "trickle down" technology from B.O.B. Housed in the same white Androbot body, he has onboard processing and speech (including text-to-speech). Although he

that come from the damage done by the same pet, resentfully chewing up thousands of dollars worth of household furnishings when it feels itself neglected! RB suggests that an RB5X could not only feed and water your pet, but let it in and out (at preprogrammed intervals, or when prompted by a bark or meow) and exercise it with stimulating games of tug-o-war or fetch the stick! With the voice synthesis option, they claim their robot can "bark" or "meow" companionably and your pet won't mind your daily desertion, if he even notices it. This whole idea is reinforced in their well known ad, where the RB5X, holding a pair of slippers in its gripper, says to an appealingly shaggy dog: "I have the slippers, could you get the paper?"

Can I be Replaced—Please?

My favorite robot application, however, is that of the robotic nanny. Ever since I read the Ray Bradbury story, "I Sing the Body Electric" (later made into the movie "The Electronic Grandmother"), I have dreamed of a gentle robot who would help me with the demanding chore of mothering four children. Someone to fix bottles, kiss scraped knees (and sit on the sufferer while applying Mercurochrome), read stories (inserting different voices for each character), and pick up all the innumerable objects that somehow or another manage to land on the floor. After attending the IPRC, I realize that my robotic replacement is closer than I had imagined. Unfortunately, before long the children will be teenagers and I will need a robotic aid who doesn't mind being ignored, yelled at, or locked out of the portions of the house that teens claim for their own. It will have to be able to act as a chauffeur and give advice to the lovelorn. It had better be able to name all of the latest rock stars and immediately recognize their music, or endure scorn and derision. I suppose this model, too, will be along as soon as we no longer need it… but at least I'll have my grandkids covered.

Affordable Robots

There are, indeed, some robots that cost $25 and up that will do useful things and provide educational experiences. MOVIT robots are small robot kits that you put together yourself. Ranging from $25 to about $100, they each have a different body and unique abilities. Some are activated by the sound of your voice or by snapping your fingers. Others can be commanded by supersonic whistles or will repeat actions you program on a small "trainer" keypad. The MOVITS sport names like Piper Mouse, Sound Skipper, Turn Backer, Mr. Bootsman (a six legged robot), and Tsunawatari Monkey (it climbs along a rope). The MOVITS seem like good fun and come highly recommended as a first robotic experience.

The most interesting and affordable computer-controlled robots, are made by Spectron Corporation of Denver, Colorado, and are designed to work exclusively with Commodore computers. Controlled with a special board that plugs into your computer's game port, these HOBBY ROBOTS can have both sensors and manipulation capabilities. They are the perfect way to start building YOUR dream robot, since you can buy them one piece at a time. All are independently useful and each can be combined with the others to make an entity who is greater than the sum of his parts. Sensors and software are the keys here and I would be willing to bet that the creator of the DEFINITIVE personal robot of the future will be someone who started out with one of these kits. Everything from cat whisker tactile sensors to infrared and articulated arms, are offered by Spectron, at a price that won't empty your pockets. If I were a kid right now, I would be saving my allowance to buy and build a Spectron robot. What do they do? That's up to you. **C**

Butterfield

(Continued From Page 57)

As more people develop a general understanding of the limitations and capabilities of computers, we will be less likely to be seduced into placing blind faith in a computer's predictions or putting up with the excuse "sorry—computer error". Butterfield believes, "The most important change that small computers have brought is they have restored to the individual a sense that he has control over the events around him. Not only can a home computer calculate a mortgage as well as the bank can, but we will no longer simply accept any nonsense that some computer prints and mails. Essentially it's related to the question of competence. If you can handle these little beasts, in one sense at least you're more competent. That in itself is probably one of the most profound things a personal computer does."

It is not only the increasing computer literacy of consumers which is changing life, Butterfield notes with some satisfaction, "This is happening within businesses as well. People are saying, 'I'm not going to send my stuff to Toronto or Montreal or wherever. I'm going to do it here because I'll see the problem right away'. As a result, many data processing departments are becoming a little disoriented. They used to have an absolute rule—the first thing you do (I'm overstating, of course) is rush to the president and have him sign an edict that no one is allowed near the computer but you. That's rule number one. Now suddenly a guy can hide a computer in petty cash; he can hide it in his expense account—mark it down as a lunch and he's got a computer in his office." C

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still needs computer commands (either in TOPO SOFT BASIC or LOGO), they are now sent from your keyboard by way of an infrared device in the manner of the IBM PC Junior's keyboard. Owners of the original model had complained that he was exceedingly heavy to tote around, so the Androbot wizards incorporated a sort of TOPOmatic control onto the top of his head—when the front is pushed, TOPO says "FORWARD!" and rolls off at a good clip. If the right or left sides are pressed, he varies direction accordingly after announcing his intentions, and if the rear edge elicits a "STOP!" he will.

His price shot up to $1,595 and as you read this, an improved TOPO III is making his debut, with an even stronger Androbody, more powerful infrared communication and a planned attachment for carrying things replacing his foldout arms. These changes have increased his price by $400, but I hope that as they catch on all the robots will decrease somewhat in price.

When asked if he thought robots would experience the same kind of dramatic price drops that have rocked the home computer market, Nolan Bushnell said, "No I don't. Robots contain many more mechanical parts than computers do and I do not foresee that kind of huge decrease. The prices are bound to go down, however, as robot companies tool up for mass production."

The TOPO's work with Apple, IBM and now Commodore computers, using an RS232 interface and a cable that connects to the infrared controller. TOPO is becoming more of a family robot with each improvement. His speech capability allows him to entertain children for hours as they hone either their computing abilities or their mathematic and scholastic skills. Although there is no commercial software yet available for him, an Androbot spokesman says that they are eagerly awaiting a flood of user written software that has already started trickling in—and are putting together procedures for buying and marketing it. Sound familiar, 64 owners?

At least one 64 owning family came home from IPRC with a robot and it was not the $25 sound-activated robot kit we had decided to ruin our budget for. Instead, when the people had bid the fascinating mechanical beings goodbye and the company reps were packing their products and making plans for next year, Nolan Bushnell signature model TOPO #129 rolled out of the hall and into the elevator. Under his own power he traveled to the adjoining Regency Hotel, accompanied by a small, excited boy and his nervous parents. Announcing "FOR-WARD!", he went out through the ornate front doors (held open by a thunderstruck uniformed doorman) and was lifted into the family car.

When we arrived home the other children greeted him with "TOPO! You're back! You're really back!" The first TOPO to run on the Commodore 64 had come to stay at the most decidedly Commodore household in Albuquerque. The official reason was that I was to help test the new Commodore version of TOPO's software and possibly do a bit of software development. But I knew the real reason. The Androbot people could not help but notice the wistful looks on all our faces when we looked at the TOPO models at the show—so like the little robot who had watched Saturday morning cartoons with the kids and helped a whole class full of other children's grandparents forget their fears and learn about computers. As far as the kids are concerned, "their" TOPO is home—he can talk to them at least! C

KODRAWLA

for VIC 20 with Super Expander and Koala Pad

By Eddie Johnson

This program, while it doesn't begin to compare with the Koala Painter for the Commodore 64, will allow you to draw and paint with your VIC 20 and will show you a few ways to use the Koala Pad to control your screen display. You will need a VIC 20 Super Expander cartridge to use the graphics commands, but the "Paddle Reader" routine will also work on the unexpanded VIC (maybe even better—after RUNning the program with the Super Expander, your function keys no longer work the way they're supposed to). The paddle reader lives in lines 100, 110 and lines 1000 through 1030, and can be used in other programs to POKE the data into the VIC 20 cassette buffer (addresses 828 to 859).

I put the drawing instructions into REMarks in the program listing. If you follow them carefully (in sequence) and experiment a little, you should become familiar with the workings of KODRAWLA fairly quickly. The rest of this article will attempt to briefly explain how it works.

Line 120: Sets up the screen in high resolution mode and sets the colors of the display. R=0 (black). Feel free to experiment with the colors.

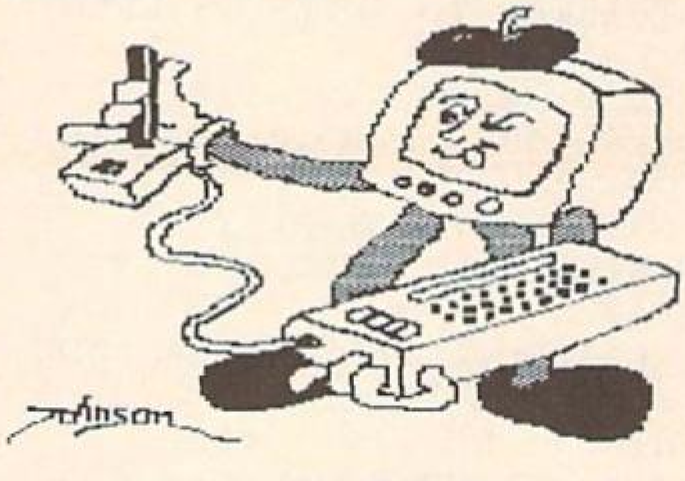
Line 130: P1 and P2 are paddle position numbers from 3 to 255 returned by the Koala Pad—multiplying them by four relates them to the Super Expander graphics screen (0 to 1023). I got lazy here, so you can't draw all the way to the very top or left of the screen (twelve is the minimum). RJOY(0) is the fire button address.

Line 140: Pressing both buttons (J=12) will clear the screen.

Line 200: Skipping over the conditionals in lines 150 to 190 for now, IF we press the right fire button (J=8) we set our start position to X2, Y2, turn off our draw control (more on this later), and GOSUB to our keyboard control routine.

Lines 2000-3020: Here's where we select our drawing controls with the keyboard. Study these lines and the conditionals in lines 150 through 190 and you will see different ways of entering your commands to the computer. In line 3010, we subtract one from the number value of our keyboard entry to make the input agree with the color name printed on the key.

Lines 150-180: IF the left fire button is pressed, THEN J=4, and the condition of the variables C, L, and D determine the action taken. Notice in line 150 that we multiply X by .75 to "round" our circle. Line 170 prevents an unwanted line being drawn to the upper left corner if you lift your stylus in the draw mode before releasing the left fire button. It will also terminate the draw routine if you move the stylus to the top left corner. Clumsy, but effective. Study line 180 and you will see why D doesn't equal 0 until line 200. Get it?



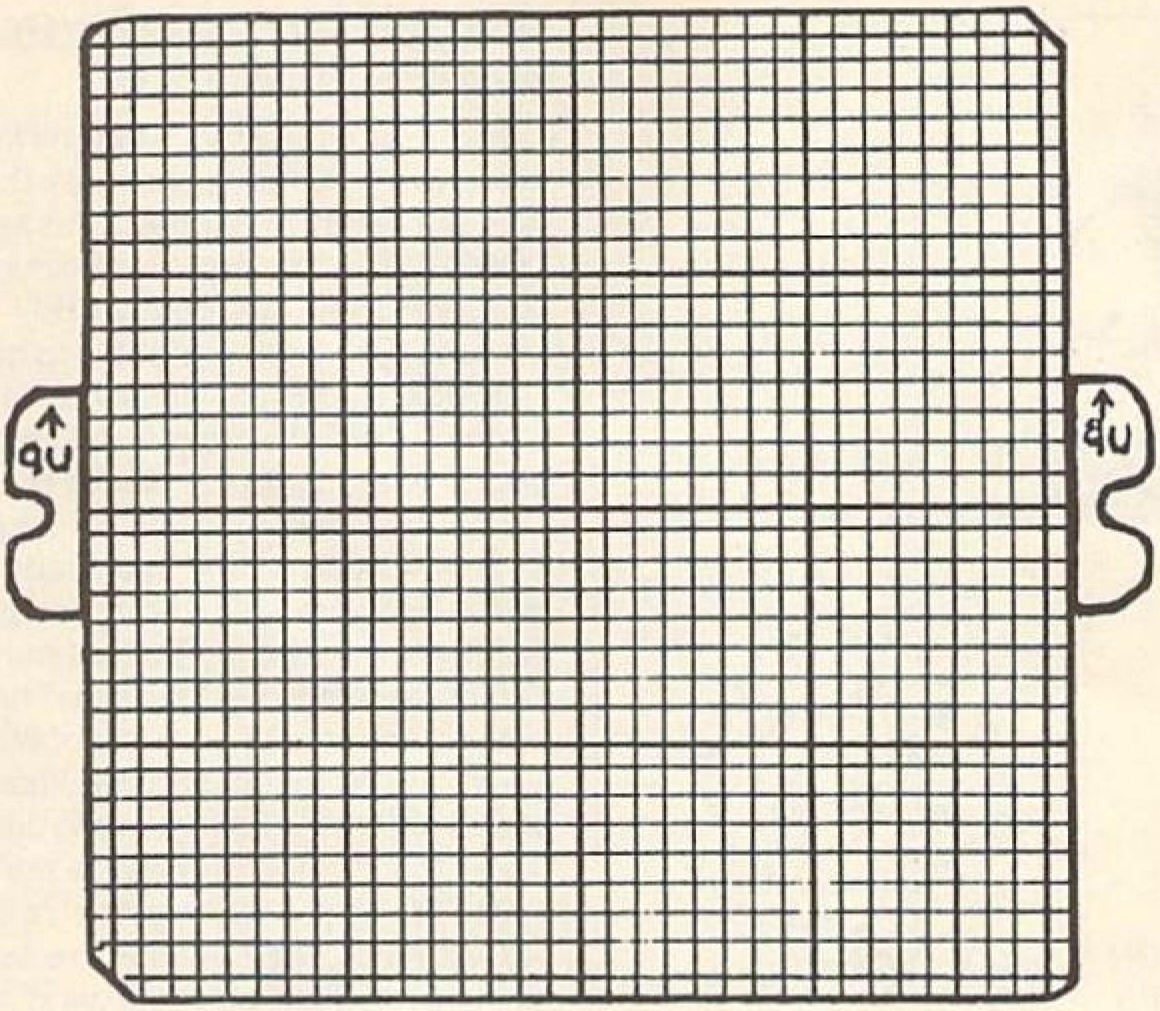
BUD IZZIT

Line 190: This just shows that the left fire button is really unnecessary in this program! But be sure you select your second coordinate before pushing "B"!

Line 900: After our start position (X2, Y2) and our drawing control have been established, we

Kodrawla

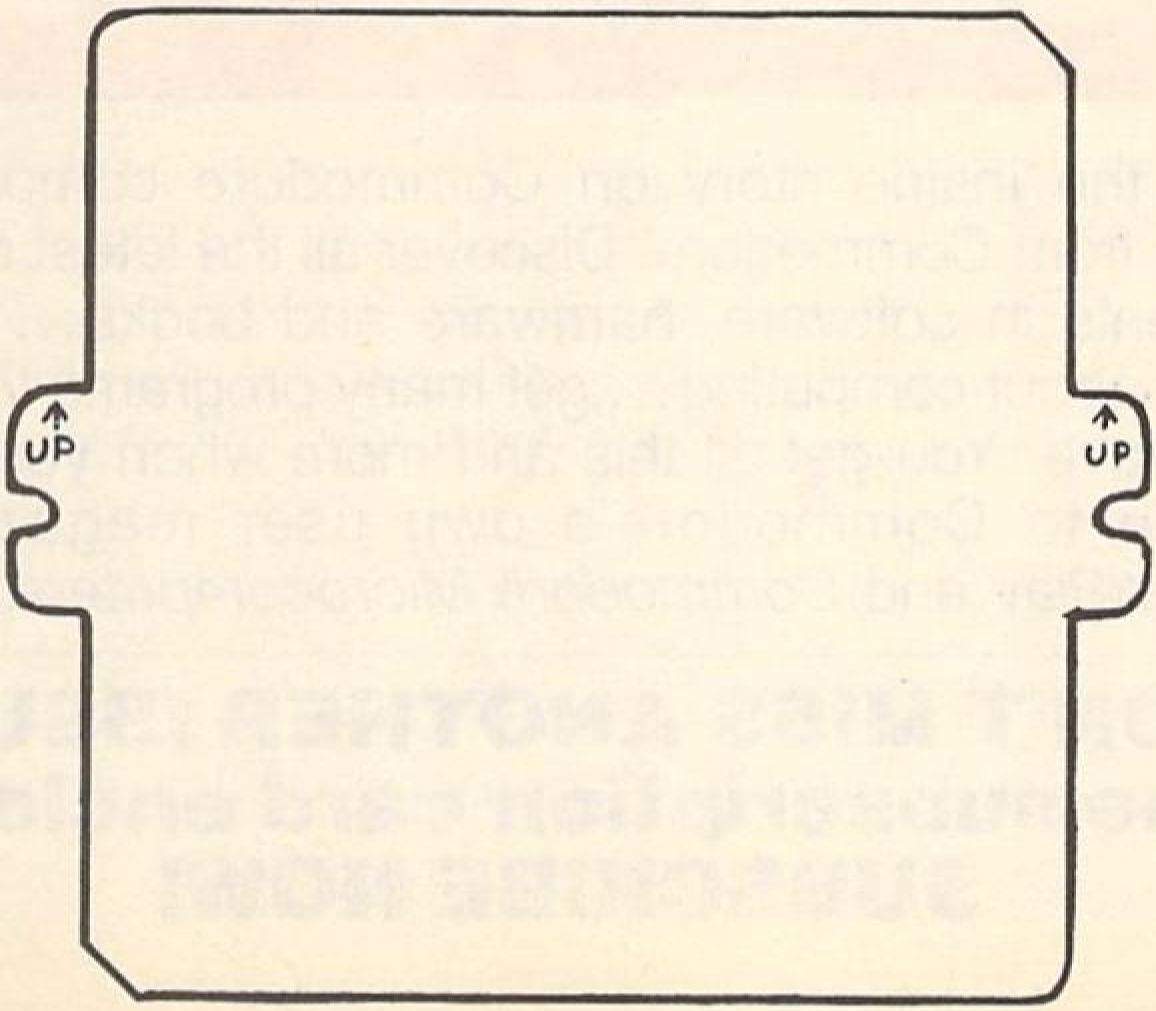
```
1 REM *** KODRAWLA ***
2 REM VIC-20 WITH SUPER EXPANDER
  AND KOALA PAD
3 REM BY EDDIE JOHNSON, 1983
5 REM KOALA PAD AND KEYBOARD
  CONTROLS:
6 REM STYLUS POSITION DETERMINES
  X,Y (START POSITION)
7 REM PRESS RIGHT FIRE BUTTON TO
  MAKE SELECTION:
8 REM "D" = DRAW; "L" = LINE;
   "C" = CIRCLE; "R" = REGION
  (COLOR); "P" = PAINT
9 REM PRESS COLOR KEY (1-8) FOR
  REGION (I.E., 3 = RED)
10 REM FOR BOX, MOVE STYLUS TO
   OPPOSITE CORNER (DIAGONALY)
   AND PRESS "B"
11 REM PRESS LEFT FIRE BUTTON TO
   EXECUTE DRAW, LINE, OR CIRCLE.
12 REM STYLUS POSITION WILL
   DETERMINE LINE END IN 'LINE'.
13 REM POSITION OF STYLUS FROM
   TOP LEFT DETERMINES SIZE AND
   SHAPE OF CIRCLE
14 REM FOR DRAW, PRESS LEFT
   BUTTON WHILE MOVING STYLUS.
15 REM PRESS BOTH BUTTONS
   TOGETHER TO CLEAR SCREEN
16 REM THERE IS NO CURSOR
   VISIBLE IN THIS PROGRAM,
17 REM SO YOU MAY WANT TO USE A
   PAPER OVERLAY ON YOUR KOALA
   PAD
18 REM TO HELP YOU KEEP TRACK OF
   YOUR DRAWING.
19 REM DO DRAWING ON 4 1/4"
   PAPER SQUARE, AND TRACE WITH
   STYLUS.
20 REM AN ACETATE OVERLAY OR
   TAPE WILL HELP HOLD DRAWING
   IN PLACE.
21 REM APPARENTLY ALL KOALA PADS
   ARE NOT CREATED EQUAL-
22 REM LINES 162 & 163 WILL
   PRINT X & Y CO-ORDINATES FOR
   UPPER LEFT CORNER.
23 REM ON MY KOALA PAD X AND Y
   BOTH EQUAL 12.
24 REM ADD 1 TO THOSE NUMBERS TO
   DETERMINE VALUES FOR LINE 170.
25 REM LINES 162 AND 163 SHOULD
   THEN BE DELETED.
26 REM THE PADDLE READER ROUTINE
   IS FROM COMPUTE!'S GAZZETTE,
    PP. 117 & 155
27 REM BY DAN CARMICHAEL.
28 REM IT WORKS BETTER THAN THE
   'RPOT(X)' ROUTINE IN THE
   SUPER EXPANDER.
100 FOR A=828 TO 859:READ J
    :POKE A,J:NEXT
110 SYS 828:P1=PEEK(251)
    :P2=PEEK(252)
120 GRAPHIC 2:COLOR 1,5,R,6
130 X=P1*4:Y=P2*4:J=RJOY(0)
140 IF J=12 THEN:SCNCLR
150 IF C=1 AND J=4 THEN
    :CIRCLE 2,X2,Y2,X*.75,Y:C=0
160 IF L=1 AND J=4 THEN
    :DRAW 2,X2,Y2 TO X,Y:L=0
162 X$="X= "+STR$(X)+"[SPACE2]"
    :Y$="Y= "+STR$(Y)+"[SPACE2]"
163 CHAR 10,1,X$:CHAR 11,1,Y$
170 IF X<13 AND Y<13 THEN:D=0
180 IF D=1 AND J=4 THEN
    :DRAW 2,X2,Y2 TO X,Y:X2=X
    :Y2=Y:RESTORE:GOTO 100
190 IF B=1 THEN:DRAW 2,X,Y TO X2,
    Y TO X2,Y2 TO X,Y2 TO X,Y:B=0
200 IF J=8 THEN:X2=X:Y2=Y:D=0
    :GOSUB 2000
290 REGION R
900 RESTORE:GOTO 100
1000 DATA 169,0,170,168,24,109,8,
     144
1010 DATA 144,1,200,202,208,247,
     132,251
1020 DATA 138,168,24,109,9,144,
     144,1
1030 DATA 200,202,208,247,132,
     252,96,0
2000 GET A$:IF A$=""THEN:GOTO 2000
2010 IF A$="L"THEN:L=1
2020 IF A$="R"THEN:GOTO 3000
2030 IF A$="C"THEN:C=1
2040 IF A$="P"THEN:PAINT R,X2,Y2
2050 IF A$="D"THEN:D=1
2060 IF A$="B"THEN:B=1
2090 RETURN
3000 GET R$:IF R$=""THEN:GOTO 3000
3010 R=VAL(R$)-1:IF R>8 OR R<1
     THEN:GOTO 3000
3020 RETURN
```

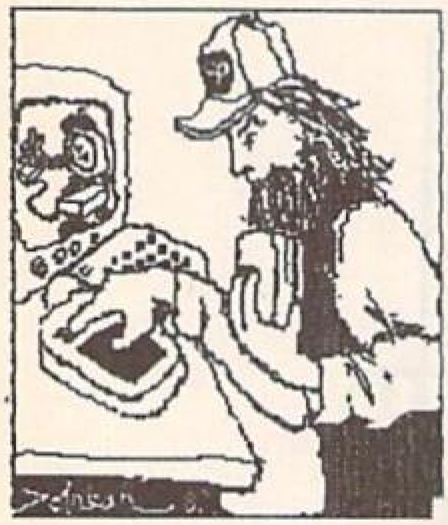


0 30 60 90 120 150 180 210 240 270 301 331 361 391

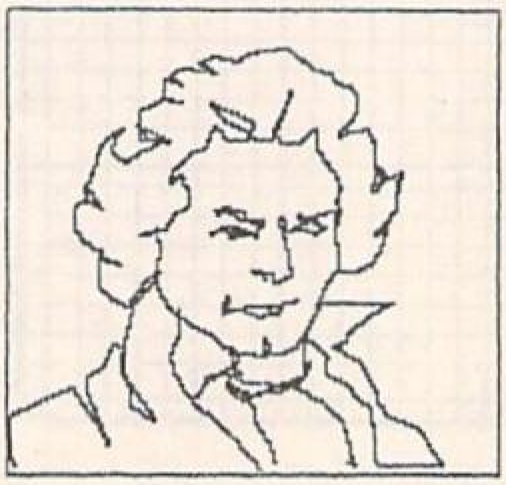
421 451 481 511 541 571 602 632 662 692 722 752 782 812

842 872 902 933 963 993 1023





SELF PORTRAIT
By Eddie Johnson



LUDWIG VON
BEETHOVEN
By Victor/Wendy 12/4/83

RESTORE our data and GOTO the beginning for our new position (X, Y).

I have provided two patterns for the acetate overlays—you may photocopy them onto acetate and carefully cut them out for use with your KODRAWLA. The numbers below the grid roughly conform to the lines on the grid—zero at the top left to 1023 at bottom right—to help you plot circles, boxes, etc. The blank one is more for freehand tracing. The UP's are printed backwards on the grid to remind you to insert it printed side down. Otherwise, you are likely to scratch off the grid as you work on it! You may want to change the grid—I got lazy again and used 8×8 to the inch graph paper, which matched the size of the Koala Pad better than anything else I had.

You can probably see lots of ways to improve or expand on this program—I can. So go right ahead and do it! I am going to add a printer dump to it (which may cause me to change line 150 to "re-round" the circle). Then I will have a "KOALATOONIST" computer cartoon studio, and all I will need will be some good cartoon ideas! Happy hacking! C

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Everything You Wanted to Know About Sprites And Weren't Afraid to Ask

By Tim Villanueva

It seems that those mysterious little creatures called sprites on the Commodore 64 are not so mysterious anymore. Everyone and his uncle have either learned to create sprites or own a good sprite maker. (Almost everyone. There are still a few new owners or people who have only recently succumbed to "Spritemania"). Once you know how to create sprites, you probably would like to know how to use them (especially for games). There have been several questions sent to Kids' Corner about moving, exploding, animating, creating and detecting sprites. In this article, I will attempt to answer some of these questions and maybe some others that haven't been asked.

Creating a Sprite

First of all, you have to be able to create a sprite before doing anything else with it. I won't go into detail in this article about creating a sprite from scratch (this can be found in the *Commodore 64 Programmer's Reference Guide*). And I was surprised to see how many of you used the sprite creator from my article in the Spring, 1983, issue of *Power/Play* when you sent in your entries in the sprite contest.

Now I would like to give you an even better short sprite editor. There have been jillions of different sprite editors published, including one in the last issue of *Power/Play*. The main difference between this one and other published sprite editors is that it uses machine language. It allows you to see the sprite you are creating on the grid as you create it. It is also FAST! In fact, I would like to challenge you to expand the BASIC part of this program and create your own full-featured sprite editor. This program uses the following keys.

Cursor Keys	—Cursor motion
Space Bar	—Turn dot on
Delete	—Erase dot
Return	—Move cursor to beginning of line
F1	—Displays data
F2	—Displays and prints data
F5/F6	—Toggles X/Y expansion
Clr/Home	—Erases grid/sprite
Home	—Homes cursor

Now that you can create a sprite, look in the *Programmer's Reference Guide* to find out how to enable (turn it on) and move your sprite (pages 131-149). [Note: The program "Sprite Examples" illustrates the techniques explained in this article. I will refer to sections of the program as I go along.] A sprite is moved by POKing its X and Y coordinates on the screen into the appropriate registers. Many of you are probably used to using the variable V as the base address to the VIC chip, and then moving your sprite with a POKE which may look like this:

```
POKE V+2,100 : POKE
  V+3,150
```

This moves sprite one to X coordinate 100 and Y coordinate 150. Now for a secret that will make your programs easier to write and read. Instead of using V+2, or V+6 etc., why not make variables to describe each coordinate register at the beginning of your program. For example, if I am about to write a program that uses sprites zero to three, I could use the following variable declarations.

[See lines 100-120]

This way, any time I want to move sprite two to a location, I use the variables X2 and Y2. This may not be necessary for those of you who know the coordinate locations by heart, but it might help some.

The next thing several people asked about is sprite collisions. These can really be a hassle sometimes because of the way

```
10 V=53248 ; REM START OF VIC CHIP

20 X0 = V :Y0 = V+1; REM COORDINATES FOR SPRITE 0

30 X1 = V+2 :Y1 = V+3; REM COORDINATES FOR SPRITE 1

40 X2 = V+4 :Y2 = V+5; REM COORDINATES FOR SPRITE 2

50 X3 = V+6 :Y3 = V+7; REM COORDINATES FOR SPRITE 3
```

the collision registers work. There are two types of collisions that you can check for. These are the sprite-to-sprite collisions or the sprite-to-background collisions (background is anything on the screen except other sprites).

Sprite-to-Sprite Collisions

A sprite-to-sprite collision occurs when a lighted dot (pixel) of one sprite touches a lighted dot on another. If a sprite bullet barely scrapes the antennae of a space monster sprite, it will cause a collision.

There is one register which clues you in to any collisions that might be happening. This is register 30 (V+30). Once again, you can create a descriptive variable in your program for this register so you can call it by name. For example: SC-V+30 where SC stands for Sprite Collision. [See line 125.] This register is just like the enable register for turning sprites on. Each sprite has one bit inside the register. You can find out if a sprite is in a collision by checking its bit to see if it's turned on. One way of doing this is the following:

```
IF PEEK(CR) AND 2↑X
  = 2↑X THEN ..
  [action]
```

[See line 400]

where X is the sprite number (0-7). This is real nifty, but can be very slow!! If you are moving several sprites at once, you will have to have a different IF statement like the one above to check for each sprite collision. And if you're writing an action game, this becomes very troublesome. So now comes secret number two: how to speed up collision detection. Since most games take a fairly significant action after a collision (i.e., blowing a sprite up, changing the score, etc.) we will not worry as much about the time taken up *after* the collision. Thus we can use less time *before* the collision, which will speed up the game. So, we can do something like this:

```
500 IF PEEK(CR)=0
    THEN 100 :
    REM BACK TO
    MAIN LOOP
```

[See line 390]

This should be at the END of your "game loop" since a game usually consists of a loop to continue actions. Now, if there is no collision happening then you continue with the game, but if a collision does occur then you will fall through this statement. Now you do all your testing to see which sprite is colliding with whom and all that stuff.

For example:

```
        510 IF PEEK(CR) AND2↑0 = 2↑0 THEN 1000: REM SPRITE 0 IN
  COLLISION
        520 IF PEEK(CR) AND2↑1 = 2↑1 THEN 1100: REM SPRITE 1 IN
  COLLISION

        530 IF PEEK(CR) AND (2↑2+2↑3) = (2↑2+2↑3) THEN 1500

            REM SPRITE 2 AND SPRITE 3 IN COLLISION
```

If you had a game where you were steering a sprite car through some sprite pylons, you might move the car towards the pylons while the player steers the car. This would be simple and you could use line 500 (above) to check for collisions. As long as a collision *doesn't* occur, you can just keep on moving the car. If the car does hit a pylon, then the program will fall through the IF statement (line 500 above). After that, you check to see which pylon the sprite car collided with. This can be seen in the sample program. Line 390 checks for any collision; if no collision occurs it loops back to line 280. If a collision occurs, line 400 makes sure sprite zero is in a collision since it is the only one we're worried about. If sprite zero is not in a collision, then line 400 goes back to line 280.

Sprite-to-Data Collisions

Since in BASIC you can only have eight sprites on the screen, it is very helpful to make some of your game graphics out of characters, especially graphics that don't move. For example, you can use programmable characters or bit-mapped graphics for some of your game pieces like the pylons we talked about above. Now we can use a sprite-to-data collision check in a game. This is done exactly the same way as a sprite-to-sprite collision, except for the collision register. For the sprite-to-data collision we used register 30 (V+30). For the sprite-to-data collision we will use register 31 (V+31). So, you can use the same formulas and programming techniques I showed you above.

[See sprite-data collision section in sample program]

Notes on Collisions

Here are a few gliches and glutches about collision detection. First, although you can tell which sprites are in collisions, you cannot tell (from the collision registers) which sprite is hitting which. So, if there are four sprites colliding and you want to know who is hitting whom, you will have to check their coordinates and see which sprites are close to each other. Secondly, you need to clear the collision register after you use it. Reading it (PEEK(CR)) clears it, but if your sprites are still touching, it sets it again and doesn't clear it until you read it again. So, what you need to do after a collision is move all your sprites so they are not colliding and then read the location once more to clear it out. You can think of the collision registers as a mailbox. Unless you take the mail out, it stays there forever.

Sprite Animation

Another question that came up is how to animate sprites while they are moving. First, we will talk about animating a still sprite. As explained in the *Reference Guide,* there are eight pointers (memory locations 2040-2048) associated with each sprite that point into memory at the starting block of the sprites definition. If you change this pointer to a different starting block, the shape of your sprite will change. For example, if you put all 63 bytes of your sprite data in the cassette buffer starting at location 832, you would POKE the sprite pointer with 13. This points it at block 13 which starts at memory location 832. WHY? Because a block is equal to 64 bytes. So block zero runs from memory locations zero to 63. Block one runs from 64-127. You can figure out where a block starts with this simple formula: START = BLOCK# * 64. So, 13*64 = 832, which is where block 13 starts. If we are working with sprite zero, the pointer is location 2040. So if we want sprite zero to look like the data in block 13, we POKE 2040 with a 13 ==> POKE 2040,13.

Now, what if we have a different shape in block 14 (START = 14*64)? We can POKE 2040,14, and the sprite will instantly change to the shape stored in block 14. We can use this feature to animate the sprite. How? Just think of how you animate cartoons on a scratch pad. Each page or frame of the cartoon has a picture that is slightly different from the one before it. Then by "flipping" through the pages, the pictures appear to be moving. Sprite animation is exactly the same. Each block can be a page with a different picture in it. By flipping through these pages, which is done by changing the sprite pointer, we can animate the picture. Using delay loops, we can slow the animation down or speed it up. Let's say you have five sprite pictures stored in blocks 192-197. The following program will animate them.

```
... enable sprite 0, put on screen ...

100  FOR BL = 192 TO 197 : REM LOOP THROUGH PICTURES

(flip pages)

    110  POKE 2040,BL          : REM POINT SPRITE AT
```

Continued On Page 96

```
BLOCK

     120  FOR T=1 TO 100:NEXT : REM DELAY LOOP

     130  NEXT BL
```

Usually you will want to move your sprite while you are animating it. For example, if you are moving a car sprite across the screen [see sprite animation section of program], you can animate it with two shapes and make it look like its tires are turning. We need to be able to move it and change its shape at regular intervals. We don't want to change its shape each time we move it one pixel or the wheels will spin too fast. The following program will move and animate a sprite with shapes in Blocks 13 and 14. It moves the sprite across the screen from left to right.

```
... enable sprite 0, put y coordinate at 100 ..

100  BL = 13 : REM STARTING PICTURE BLOCK

120  FOR X = 1 TO 255 : REM HORIZONTAL MOTION

130  IF INT(X/4)=X/4 THEN BL=BL+1 : IFBL>14 THEN

BL=13

REM AFTER EACH 4 PIXEL MOTIONS, CHANGE BLOCK POINTER

REM WHEN REACH MAX BLOCK POINTER, RESET TO LOWEST

140  POKE 2040,BL : REM POINT SPRITE AT BLOCK BL

150  NEXT X
```

[See lines 550-590]

By changing the four in line 130, you can change the interval at which the sprite changes shape. For example, if you make it a two, the sprite will animate (change shapes) much faster because it will change after each two pixel motions. By changing the starting and finishing block numbers (13,15), you can animate any number of blocks with this program. For example, change the 13 in lines 100 and 130 to a 192. Then change the 15 in line 130 to a 200. Now the program will animate the shapes in blocks 192 to 200 (no matter what the shapes are!!).

If you have questions on sprites, games or graphics, write to me care of the Kids' Corner address. I can't write everyone back, but I will try to answer in the text of future articles. Those people who write Betsy with the questions that inspired this article will probably recognize themselves—I also went through hundreds of Kids' Corner submissions and addressed many problems I found in the programs that were *not* selected. As you learn more tricks, try sending in more programs. Don't give up if your first try isn't published. I sent one particular game I wrote to five publishers, each of whom asked me to change *something.* It *was* finally accepted in a much different form than the original. If you make neat things, send them in! I will get to see them, too. [See how to send stuff, elsewhere in Kids' Corner.]

Sprite Editor

```
10 REM **** SHORT SPRITE EDITOR
   ****
20 REM **** BY TIM VILLANUEVA
   ****
30 POKE 53281,0:POKE 53280,7
40 FOR T=0 TO 133:READ A
   :POKE 49152+T,A:NEXT
50 V=53248:POKE V+21,1
   :POKE 2040,13:POKE V,255
   :POKE V+1,180:POKE 34808,13
55 POKE 50436,3:POKE 50435,64
60 POKE 53281,1:PRINT "[CLEAR]
   "TAB(25)"[WHITE]SPRITE EDITOR
   [DOWN]":POKE 53281,0
70 PRINT TAB(25)"BY TIM "
80 PRINT TAB(25)"[SPACE3]
   VILLANUEVA"
85 PRINT TAB(25)"[DOWN]
   USE CURSOR"
86 PRINT TAB(25)"KEYS TO MOVE"
87 PRINT TAB(25)"[DOWN]
   SPACE TO MARK"
88 PRINT TAB(25)"[DOWN]
   DELETE - ERASE"
90 PRINT TAB(25)"[DOWN]F1 - DATA"
95 PRINT TAB(25)"[DOWN]
   F2 - PRINT DATA"
96 PRINT TAB(25)"[DOWN7]
   F5/F7 - EXPAND"
100 SYS 49251:SYS 49152: REM GRID
110 X=0:Y=0
120 ML=1024+X+40*Y:CH=PEEK(ML)
130 POKE ML,CH OR 128
140 GET S$:IF S$=""THEN 140
150 IF S$="[RIGHT]"AND X<23 THEN
    X=X+1
160 IF S$="[LEFT]"AND X>0 THEN
    X=X-1
170 IF S$="[DOWN]"AND Y<20 THEN
    Y=Y+1
180 IF S$="[UP]"AND Y>0 THEN
    Y=Y-1
190 IF S$=" "THEN CH=42
    :S$="[RIGHT]":GOTO 150
200 IF ASC(S$)=20 THEN CH=46
    :S$="[LEFT]":GOTO 150
210 IF ASC(S$)=13 THEN X=0
220 IF S$="[CLEAR]"THEN 100
230 IF S$="[HOME]"THEN X=0:Y=0
240 IF S$="[F1]"THEN PR=0
    :GOSUB 500
245 IF S$="[F3]"THEN PR=1
    :GOSUB 500
246 IF S$="[F5]"THEN POKE V+23,
    1-PEEK(V+23)
247 IF S$="[F7]"THEN POKE V+29,
    1-PEEK(V+29)
250 POKE ML,CH:SYS 49152:GOTO 120
500 FOR T=0 TO 62:POKE 33600+T,
    PEEK(832+T):NEXT
505 POKE 56576,(PEEK(56576)AND
    252)OR 1
510 POKE 648,132:POKE 53281,1
    :PRINT"[CLEAR]";:POKE 53281,0
515 IF PR=1 THEN OPEN 4,4
520 C=0:FOR T=0 TO 62
530 PRINT PEEK(832+T);:IF PR=1
    THEN PRINT#4,PEEK(832+T);
540 C=C+1:IF C=3 THEN C=0:PRINT
    :IF PR=1 THEN PRINT#4
550 NEXT
555 IF PR=1 THEN PRINT#4:CLOSE 4
560 PRINT"[DOWN]PRESS ANY KEY TO
    CONTINUE"
570 GET S$:IF S$=""THEN 570
580 POKE 56576,(PEEK(56576)AND
    252)OR 3
590 POKE 648,4
600 RETURN
1000 DATA  169,4,133,252,169,0,
     133,251,169,21,141,5,197,
     173,3,197
1010 DATA 133,253,173,4,197,133,
     254,162,0,160,0,169,128,141,
     2,197
1020 DATA 140,6,197,234,234,234,
     160,0,169,0,145,253,172,6,
     197,177
1030 DATA 251,201,42,208,15,140
     6,197,160,0,177,253,13,2,
     197,145
1040 DATA 253,172,6,197,200,24,
     110,2,197,144,228,232,230,
     253,224,3
1050 DATA 208,201,165,251,24,105,
     40,144,2,230,252,133,251,
     206,5,197
1060 DATA 208,181,96,169,0,133,
     251,169,4,133,252,162,21,
     160,0,169
1070 DATA 46,145,251,200,192,24,
     208,249,165,251,105,39,144,
     2,230,252
1080 DATA 133, 251, 202, 208,
      232, 96
```

Sprite Examples

```
5 POKE 53281,0:POKE 53280,0
10 REM *** SPRITE EXAMPLES ***
20 REM
30 REM *** READ IN SPRITES ***
40 FOR T=0 TO 62:READ A
   :POKE 13*64+T,A:NEXT
50 FOR T=0 TO 62:READ A
   :POKE 14*64+T,A:NEXT
60 FOR T=0 TO 62:READ A
   :POKE 15*64+T,A:NEXT
70 REM
80 REM *** INITITIALIZATION **
90 V=53248
100 X0=V:Y0=V+1
110 X1=V+2:Y1=V+3
120 X2=V+4:Y2=V+5
130 SC = V+30 : DC = V+31
    :REM SPRITE COLL.  /  DATA
    COLL.
140 POKE V+29,0:POKE V+23,0
160 POKE V+21,0 : REM DISABLE
    SPRITES
170 PRINT"[CLEAR,DOWN]1. SPRITE-
    SPRITE COLLISION" :PRINT"
    [DOWN] 2. SPRITE ANIMATION"
175 PRINT "[DOWN] 3. SPRITE-DATA
    COLLISION"
180 GET S$:IF S$=""THEN 180
190 ON VAL(S$)GOTO 210,500,700
195 GOTO 180
200 REM
201 REM **** SPRITE - SPRITE
    COLLISION
210 REM **** USE JOYSTICK TO MOVE
220 REM **** YOUR SPRITE (WHITE)
225 PRINT "[CLEAR]"
230 POKE V+21,7: REM SPRITES 0-2
240 POKE 2040,15:POKE 2041,15
    :POKE 2042,15:REM SPRITE
    POINTERS
250 X=130:POKE X0,X:POKE Y0,60
260 POKE X1,INT(RND(1)*70)+100
    :POKE Y1,255: REM CAR 1
270 POKE X2,INT(RND(1)*70)+100
    :POKE Y2,210: REM CAR 2
275 I=PEEK(SC): REM CLEARS
    REGISTER
276 POKE Y0,(PEEK(Y0)+10) AND 255
    : REM MOVES PLAYER FORWARD
280 P=15-PEEK(56320)AND 15
    : REM JOYSTICK
310 IF P=4 THEN DX=-4
320 IF P=8 THEN DX=4
```

```
330 IF X+DX>100 AND X+DX<170
    THEN X=X+DX
340 POKE X0,X: REM PLAYERS CAR
350 PRINT "[SPACE9,RVS] [RVOFF,
    SPACE4,YELLOW,SPACE2,WHITE,
    SPACE5,RVS] [RVOFF]"
360 POKE Y1,(PEEK(Y1)-6):IF PEEK
    (Y1)<=10 THEN 260: REM CAR 1
380 POKE Y2,(PEEK(Y2)-6)AND 255
    : REM CAR 2
387 PRINT "[SPACE9,RVS] [RVOFF,
    SPACE4,YELLOW,SHFT B2,WHITE,
    SPACE5,RVS] [RVOFF]"
390 P= PEEK(SC):IF P=0 THEN 280
400 IF (P AND 2^0) <> 2^0  THEN
    280:REM SPRITE #0 NOT IN
    COLLISION
410 PRINT " BANG !!!!!!!!!"
420 FOR T=0 TO 16:POKE 53281,T
    :POKE 2040,0:FOR G=0 TO 20
    :NEXT:NEXT
430 GOTO 90
440 REM
500 REM ****** SPRITE ANIMATION
    *******
510 REM
520 POKE V+21,2 : REM TURN ON
    SPRITE #1
530 POKE V+23,2:POKE V+29,2
    :REM EXPAND IT
540 POKE Y1,100: REM SET UP Y
    COORD.
545 ML=13: REM STARTING PICTURE
    BLOCK
550 FOR X=255 TO 0 STEP -1
    :REM MOVE SPRITE RIGHT TO LEFT
560 POKE X1,X : REM X COORD.
570 IF INT(X/5)=X/5 THEN ML=ML+1
    :IF ML>14 THEN ML=13
580 POKE 2041,ML : REM SPRITE
    POINTER
590 NEXT X: GOTO 90
700 REM
710 REM
720 REM ***** SPRITE - DATA
    COLLISION
725 REM
740 POKE V+21,1:POKE 2040,15
750 POKE X0,130:POKE Y0,70
    : REM POSITION CAR
760 TB=10:A$=" 2[RVS,CMDR +38,
    RVOFF,UP,RIGHT2]"
    :REM BACKGROUND
```

(Continued On Page 121)

Obfuscode

By Dr. Petrie Curryfavor

HoorAy! It's anOther Letter from the *Brilliant* and Debonair Dr. Petrie Curryfavor! And What do we have *This* Time? "OBFUSCODE?"! A Code that canNOT be broken without your own *secret* PassWord! There is no matheMatical or Logical Method that can be used to DeCode a MESSage written in "OBFUSCODE?"! In Fact, there is No printer routine in this program, BeCause even crafty old Dr. Curryfavor could Not figure out a Way to DeCypher a PrintOut of an ObfusCoded MESSage. OBFUSCODE does allow you to save your Secret Epistle onto tape, however, so you may still use this Code Book to communicate with other Silicon Panthers.

When you RUN the program, the MENU will allow you to select from fiVe options:

1. ENTER
2. DISPLAY
3. DECODE
4. SAVE
5. LOAD

To wRite your MESSage, type "1" plus RETURN—you will then Be asked for a CODE NUMBER. When you type in a number—aNy *Positive* number will do (withIn Reason!)—you will not see it, BeCause it is Being eNtered in White on a White BackGround. It actually doesn't matter What number yoU use, but the InVisible eNtry lOOks more Mysterious if someOne is SpYing On yOu.

When yoU hit RETURN, You will see aN underLine cursor at the Top Left of the screen. As the teXt is ENTERed, it will be PRINTed in ReVerSe on One line, while the Coded text will appear in reverse OFF on the line below. When you near the enD of the line (try to limit yourSelf to NineTeen CHaRacters per line), hit RETURN, and your cursor will skip a line. IF you type More than Twenty-One CHaRacters, THEN the proGram will "wRap" the letters for you, but you may Get some Funny ReSults in your disPlay.

We aRe limited (by the VIC 20 memory) to Eight lines of teXt (plus Eight lines of Code), so plan your MESSage with Care. When you aRe finished, Hit the Left Arrow key ("←") to ReTurn to the MENU.

IF you select "(2) DISPLAY", you will see Just the Coded MESSage. Since this is made up of RaNDomly generated letters, there is No way to figure out What It Means (the letter "E" could be RePreSented by several different letters, for eXample.)

When you try "(3) DECODE", you will Be asked for your PASSWORD, which will also Be eNtered InVisibly. Any eNtry but the ReQuired PassWord will ReTurn you to the MENU. If your eNtry is correct, the screen will Show you your MESSage in "clear."

When yoU SAVE or LOAD, the program asks you for a File name. Type it in and hit RETURN. When the "PRESS '←' FOR MENU" prompt apPears, STOP your DATAsette and Press the Left Arrow key.

Let's lOOk at the program to see How all of this is Done:

13

This may be the sneakiest line in the program—select a Line Number beTween 1 and 99 (sentiMental old Dr. C. chose his Lucky Number, 13), and choose aNy word you want for PW$ (modest old Dr. Curryfavor chose one that he would Be Sure to reMember.) To keep eNeMy spies from LISTing the Program to Find out what PW$ is, tricky old Dr. C. added a $tring of "DELetes" to Erase the line when it is LISTed. The way to Do that is to type:

PRINT"

(with *One* set of Quotation marks) and hit RETURN. Then CuRSoR UP to righT afteR the quote marks and while holding down the SHIFT key, hit "INST" as many Times as there aRe spaces to DELete (you won't see anyThing happen yet.) Then ReLease the SHIFT key and hit the "DEL" key the same number of times as you hit INSerT. You will see a $tring of ReVerSe "T" 's. Then add the closing quote marks and hit RETURN. Now whenEver you

LIST that line, you will see NoThing there but one set of quotation marks, and IF you Did it Right, even the Line Number is gone! (If you Use a Six Letter PassWord and a two digit Line Number, you need 22 DELetes.)

100-130

This is the MENU. Line 120 will allow you to DIMension the arRAy only on: (1) ENTER, or (5) LOAD. The ON M GOTO (Line 130) RePlaces fiVe IF... THEN stateMents. CrUNch, cruNCH!

140

This line takes your CODE NUMBER, Multiplies it by −1, and uses it as a "seed" in the RND(N) stateMent. A minus number in a RaNDom stateMent means that the Same Set of RaNDom numbers will Be generAted for Each value of "N" every time you RUN the program. This may Fool people into Thinking that this is a Real Code!

150-250

This is the Main LooP for ENTERing your MESSage. Line 170 is the "wRap-a-Round" routine—R is the number of Rows, and C is the number of Columns. Line 180 sends Us to the "FILE FILLED" message IF we try to type more than Eight lines.

Line 190 is Part of our DELete routine (IF X$ = CHR$(20) which is the DELete key.) "OBFUSCODE?" allows you to DELete as many CHaRacters as you want, but it takes some FanCy FootWork to keep from messing everyThing up. This line is CompliCated to eXplain, but if you study it along with Lines 220, 230, and 240 you will see How it Sets UP several things:

1. We change X$ to work with our ForMatter in Line 220
2. We PrePare a blank space (K=32) for an eraser
3. We "BackSpace" (C=C−1) Twice through our arRAy (A$(R, C)) and RePlace the CHaRacters that were there with "Nulls" ("").

Line 200 lets punctuation Marks, numbers, etc., GO ThrOugh without change, and Line 210 selects a RaNDom number from 65 to 90 to Be used for our RaNDom letter Code.

Line 220 is the line that PRINTs the teXt and Code to the screen. Notice How the cursor jUmPs ArOuNd between the two lines, changing beTween ReVerSe and reverse OFF. IF X$ = RETURN (CHR$(13)), THEN K=13 (see Line 200) so this line PRINTs two carriage RETURNs. However, after the Second one, we also PRINT a CuRSoR uP, so we have to PRINT again at the enD, ReSet C to 0, and add 1 to R for the beGinning of a new line. Line 230 ReLocates the cursor after a DELete.

Line 240 is where we Build our arRAy. First we store our actual teXt (X$), add 1 to C, store our RaNDom CHaRacter right after it, and add anOther 1 to C. This is why our "C" DIMension is about Twice as long as the number of Columns on a VIC 20. When we DISPLAY or DECODE our MESSage, we onLy PRINT half of the CHaRacter$ in each Row.

Line 270 is our DISPLAY routine—Notice that "P" starts at 1 and mOvEs ThRoUgH tHe CoLuMnS 2 STEPs at a time. This means it will only PRINT the RaNDom letters to the screen (the oDd NuMbErS.)

280-290

280 asks for your PassWord and will send you Back to the MENU IF your eNtry is wRong. 290 is just like Line 270, only since P starts at 0, it PRINTs only the EvEn NuMbErS.

300-320

This is the SAVE routine—eNter your File name, press RETURN, and follow the InStructions. When the Menu Prompt apPears, STOP the ReCorder, and ReTurn to the MENU.

330-370

This routine will LOAD a previously SAVEd program from the tape. If you don't eNter a File name, it will LOAD the *next* data File on the tape. As with the SAVE routine, press STOP on the DataSette when you see the MENU prompt. With both SAVE and LOAD, make Sure the Tape is properly Positioned with REWIND and FAST FORWARD.

380-400

All those "GOTO 380" commands Bring us here—And For What? To wait for you to hit the Left Arrow Key ("♦") to ReTurn to the MENU, that's What! And that's the enD of the Program LISTing!

As usual, kindly old Dr. Curryfavor wrote this Program on his Favorite (CurryFavorite?) VIC 20 Komputer, and, as usual, PeoPle aRe going to Want to Know if it will work on a Commodore 64. Well, busy old Dr. C. hasn't been able to Test it on a C-64, but the "Fix" that we used on the "BACKWORDS!" Code Book in the Last Issue should work on "OBFUSCODE?" as well. You don't have the LasT Issue? WhY Not? OK, kindly old Dr. Curryfavor will RePeat himSelf aGain, once More.

First, to get a White screen, add this line:

```
10 POKE 53281,1:CL=54272
```

(54272 is the DiFference beTween the CoLor memory map and the Screen Memory Map on the C-64.) Then, since the C-64 has 40 Columns instead of

22, we can Draw a Red line to Indicate the enD of the page:

145 FOR L=1046 TO 2006 STEP40:POKE L,101:POKEL+CL,2:NEXT

The AutoMatic Line wRap should help, if you forget to Hit RETURN, but it may lOOk funny on the Screen.

If you would Rather Not type in this program yourSelf, you may send $3.00 with a blank Tape or Disk in a Suitable Self-Addressed, Self-Stamped Mailer to:

Dr. Petrie Curryfavor
c/o Eddie Johnson
2928 Tennessee NE
Albuquerque, NM 87110

Checks or Money Orders should be made out to Eddie Johnson. Dr. Curryfavor is much too busy to run to the Bank himSelf. If you have aNy Problems, Be sure to let kindly old Dr. Curryfavor Know about them. That's all for Now, from your Friend and Mine,

Dr. Petrie Curryfavor
Confusionist and
Professor of Obfuscation

C

```
1 REM ***** OBFUSCODE? *****
2 REM BY DR. PETRIE CURRYFAVOR,
  1984
3 REM 2928 TENNESSEE NE,
   ALBUQUERQUE, NM 87110  505)
  299-1662
10 POKE 53281,1:CL=54272
13 PW$="GENIUS":PRINT"[DEL22]"
100 PRINT"[CLEAR,RVS,BLUE]
     **** OBFUSCODE? **** "
    :PRINT"[DOWN] (1) ENTER"
    :PRINT"[DOWN] (2) DISPLAY"
110 PRINT"[DOWN] (3) DECODE"
    :PRINT"[DOWN] (4) SAVE"
    :PRINT"[DOWN] (5) LOAD"
    :INPUT M
120 IF M=1 OR M=5 THEN DIM A$(9,
    43)
130 ON M GOTO 140,270,280,300,330
    :IF M<1 OR M>5 THEN 100
140 INPUT"[CLEAR]CODE NUMBER
    [WHITE]";N:N=N*-1:RN=RND(N)
    :PRINT"[BLUE,CLEAR]":R=1
145 FOR L=1046 TO 2006 STEP 40
    :POKE L,101:POKE L+CL,2:NEXT
150 GET X$:PRINT"[CMDR @,LEFT]";
    :IF X$=""THEN 150
160 IF X$="[BACK ARROW]"THEN 100
170 IF C>42 THEN C=0:R=R+1:PRINT
180 IF R>8 THEN 260
190 X=ASC(X$):IF X=20 THEN X$="
    [LEFT] ":K=32:A$(R,C)=""
    :C=C-1:A$(R,C)="":C=C-1
    :GOTO 220
200 IF X<65 THEN K=X:GOTO 220
210 K=INT(RND(1)*26)+65
220 PRINT"[RVS]"X$"[RVOFF,DOWN,
    LEFT]"CHR$(K)"[UP]";
    :IF K=13 THEN PRINT:C=0:R=R+1
230 IF X$="[LEFT] "THEN PRINT"
    [LEFT]";
240 IF X<>20 THEN A$(R,C)=X$
    :C=C+1:A$(R,C)=CHR$(K):C=C+1
250 GOTO 150
260 PRINT"[RVS,RED]*** FILE
    FILLED[^] *** ":GOTO 380
270 PRINT"[CLEAR]":FOR D=0 TO 9
    :FOR P=1 TO 43 STEP 2
    :PRINT A$(D,P);:NEXT:NEXT
    :GOTO 380
280 INPUT"[CLEAR]PASSWORD[WHITE]
    ";IN$:PRINT"[BLUE]";
    :IF IN$<>PW$THEN 100
290 FOR D=0 TO R:FOR P=0 TO 42
    STEP 2:PRINT A$(D,P);:NEXT
    :NEXT:GOTO 380
300 INPUT"[CLEAR]SAVE";F$
    :OPEN 1,1,2,F$
310 FOR A=0 TO R:FOR B=0 TO 43
    :PRINT#1,A$(A,B);:NEXT:NEXT
320 CLOSE 1:GOTO 380
330 INPUT"[CLEAR]LOAD";F$
    :OPEN 1,1,0,F$
340 FOR R=0 TO 9:FOR C=0 TO 43
    :GET#1,G$:A$(R,C)=G$
350 IF G$=""THEN 370
360 NEXT:NEXT
370 CLOSE 1
380 PRINT"[HOME,RVS,PURPLE,
    SPACE2]PRESS '[BACK ARROW]
    ' FOR MENU[SPACE2]"
390 GET M$:IF M$<>"[BACK ARROW]
    "THEN 390
400 GOTO 100
```

A Letter

Editors:

You have only yourselves to blame! I'm afraid that as long as you continue to publish Dr. Curryfavor's dopey programs, he will probably continue to submit them. I wouldn't mind so much, except that the indefatigable Dr. C. insists on using *my* VIC 20 to do all of his work. Every time I go to use my computer, there he is, huddling over it, cackling and chortling!

This latest effort, "OBFUSCODE?", at least has the advantage of being unsolvable without a password, so I didn't have to waste any time writing my own decoder for it. Instead, I have enclosed a simple substitution program, "SUBSTOOT", that uses PEEKs and POKEs to change the characters on the screen *after* you have typed them.

When you first type your message, it will appear as a bunch of symbols (punctuation marks, etc.) After you have completed the message, pressing the function keys will change the display. f3 and f5 will change the characters by one number (plus or minus) and f1 and f7 will change them by plus or minus 32.

This is done in lines 180 and 190. The PEEK in line 190 finds out what the character is in location P and the POKE changes it by the value of X. Line 130 checks for the function keys and lines 210 and 240 assign values to them.

This program is even more useless than Dr. Curryfavor's program, but at least it's short. If you want to type it in, it's up to you. Remember, though, you were warned!

Have fun,
Eddie Johnson

```
1 REM ***** SUBSTOOT *****
2 REM UN-EXPANDED VIC 20
3 REM BY EDDIE JOHNSON, 1984
4 REM 2928 TENNESSEE NE, ALBUQUE
  RQUE, NM 87110  505) 299-1662
5 REM F1 = -32   F3 = -1   F5 =
  +1   F7 = +32
100 PRINT"J";
110 GETA$:IFA$=""THEN110
120 IFASC(A$)<33THENPRINTA$;
    :GOTO110
130 FORD=1TO4:IFA$=CHR$(D+132)
    THEN160:NEXT
140 PRINTCHR$(ASC(A$)-32);
150 GOTO110
160 ONDGOSUB210,220,230,240.
170 FORP=7680TO8185
180 IFPEEK(P)+X<0ORPEEK(P)+X>
    95THENX=X*-1
190 IFPEEK(P)<>32THENPOKEP,PEEK
    (P)+X
200 NEXT:GOTO110
210 X=-32:RETURN
220 X=-1:RETURN
230 X=1:RETURN
240 X=32:RETURN
```

C

Computer Searchword

By John K. Young

Enhance your personal storage of computer terms by retrieving 32 of them from the Power/Play Searchword Key is on page 128.

A	C	C	E	S	S	R	F	R	F	Y	A	N
S	U	C	E	P	S	S	E	R	G	E	R	B
T	T	I	C	L	S	E	I	T	L	K	U	A
M	A	A	F	I	L	E	C	B	T	B	E	S
R	L	R	N	T	N	E	I	O	B	A	H	E
L	S	P	B	D	A	T	A	L	R	L	C	I
H	U	I	L	N	A	A	E	D	S	P	A	S
T	F	Y	S	P	R	L	O	G	C	M	C	D
O	I	X	M	Y	C	U	O	E	R	O	T	S
O	A	O	E	U	L	B	B	N	E	A	E	U
M	C	T	R	D	P	A	S	T	E	E	T	N
S	S	V	G	H	N	T	N	E	N	I	A	E
D	E	L	E	T	E	I	P	A	R	W	P	M

Access
Analysis
Base
Bubble
Cache
Call
Cell
Compatible
Curve
Cut
Data
Delete
File
Friendly
Index
Input
Integrate
Key
Menu
Merge
Paste
Pie
Process
Regress
Scatter
Screen
Smooth
Split
Standalone
Store
Tabulate
Wrap

computer know-how

kids corner

How to Submit Things to Kids' Corner

Betsy Byrne

Programs: *Must* be sent on clearly marked disk or tape, with computer type and your name, address, and PHONE NUMBER. If your program is for the VIC, mark the label with the amount of memory you had plugged in when you saved the program. Send a printout (listing) if you can, and BE SURE that your disk or tape is mailed in a PADDED protective envelope. Tapes should be in a mailing case, disks between two pieces of stiff cardboard. Protective envelopes are found at office supply stores for around 25 cents. They're worth it!

Articles, Stories, Poems, etc.: Should be typed or computer printed, double spaced, each page numbered, and headed with the title and author's name, address, and phone number. I can, if absolutely necessary, accept text that is neatly hand printed on every other line, each page numbered and headed as described above.

Photographs: Color or black and white, preferably 35mm. Taped or otherwise attached to a stiff piece of paper or cardboard (but make sure they can be removed without damaging them). Label the paper with some type of caption, the name(s) of the person(s) pictured, and the name, address and phone number of the sender. (School pictures are just fine.)

Drawings: Black and white might be best; at least outline things in a dark color if you can. Make them big enough that details will show if they have to be reduced. If you are sending a cartoon, print the captions in the balloons very carefully, or get someone who is really good at printing to do the words for you. Mail them using the same directions as for photographs.

If you are sending a program, don't forget to include the directions! It's a good idea to have them right in the program if you can. Be sure to keep a copy of everything you send. I might need to call you about it, and unfortunately, I can't send anything back. If you have already sent something in and didn't see it in this issue, remember that we have to get *Power/Play* ready for printing almost THREE months before you read it! If something you sent is going to be in the magazine, you will probably get a phone call from me before you see it in print so don't forget to include your AREA CODE and phone number.

Even if you are sending a drawing, photo or program, write something that tells a little bit about YOU. Don't forget to send a picture of yourself!

The address to send things to is:

COMMODORE KIDS
c/o BETSY BYRNE
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ALBUQUERQUE NM 87109

C

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Prog ● Business Clients ● Cash Flow ● Code Practice
Color Maze ● Crops ● Decision Maker ● Dentist Story
Disk Sort & Print ● Eraser ● Exec 2 ● F/S Analysis ● Grungy
Towers ● Guess & Cheat ● Gunners ● Hi Score ● IRA ● Just-
Chuck Luck ● Leapfrog ● Letter Puzzle ● Life 2.5 ● Memory
Quiz ● Moose Story ● Multiplication ● Music Producer
Name ● Pay Calc ● Payroll Calc ● QSO Vic ● Quadratic
Equat ● Roman Numerals ● Safe Cracker ● Space-War
Strange Dice ● The Bomb ● The Entertainer ● UFO Offense
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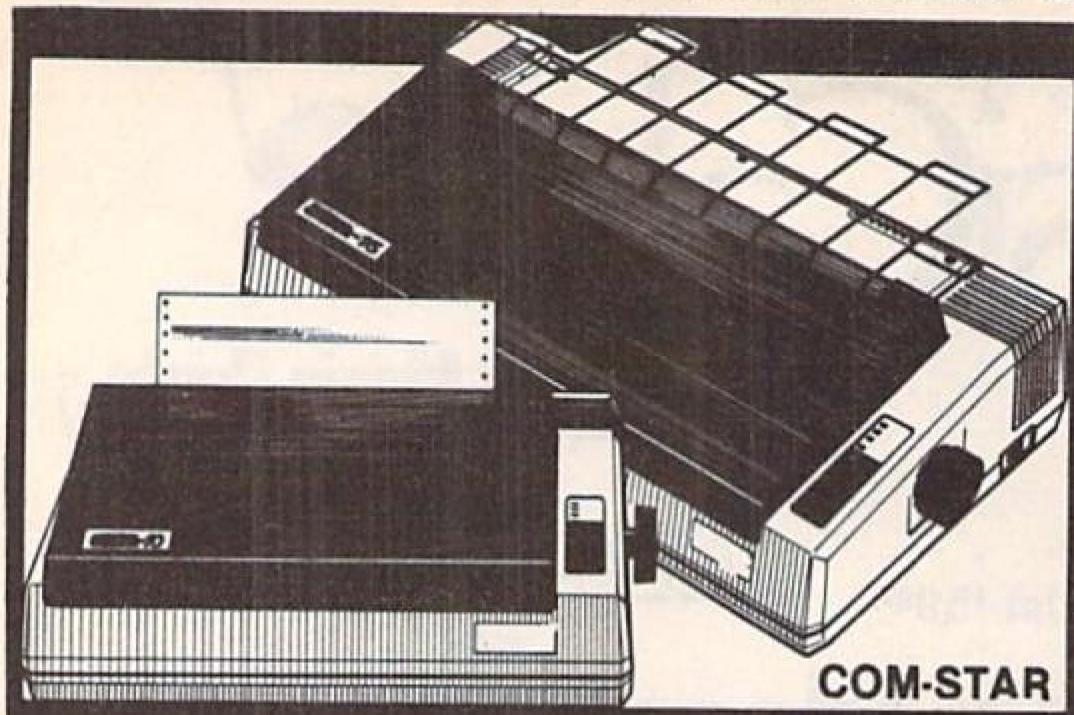

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Letters to my Grandchildren

Part 2: Finger Multiply

By F. H. Shedd

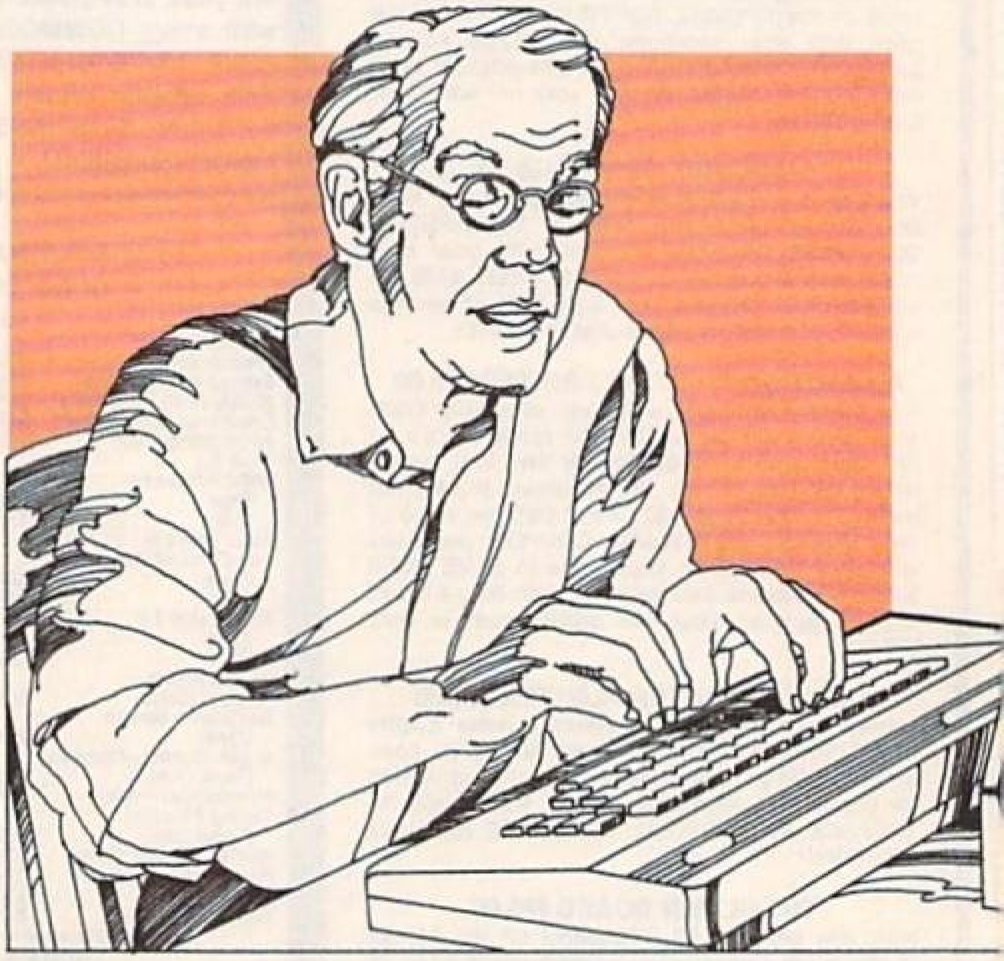
Dear Miriam and Lucas:

I'm glad you enjoyed the Arabic-to-Roman-to-Arabic Numeral program and that your classmates also found it interesting. They did bring up some important questions.

Several as to the meaning of certain words I used I will not try to answer in detail. I think it is a great mistake to "write down" to anyone. If you don't know a word look it up in the dictionary and make a written note for later review. Don't go to the next sentence until you do. A great many people have a very limited vocabulary and even though they read important information they do not comprehend it, and what is much worse they often misconstrue its meaning. Ignorance is much less dangerous than false knowledge.

However, even in the face of being charged with prolixity (long-windedness, verbosity), I will try to give parenthetical (in parentheses) information in regard to some sesquipedalian (over long; from the Latin, meaning a step and a half) terms or those having a peculiar (from the Latin, meaning private property) usage in mathematics. Enough humor and back to your questions.

Your first question was about how the Romans handled fractions. Until the importation of the Indian (Hindi) mathematics the Greeks, Romans and Egyptians avoided their use as much as possible and concentrated on integer (whole number) computations. The Roman mathematician was limited to reciprocal (the quotient of unity divided by the number) fractions which were often indicated by a superscript over the Roman numeral. The superscript was at the option of the user and in the following examples I have used a simple bar. Also they did not have a + mark as a symbol of addition.



A series of fractional values implied the operation.

$\overline{\text{II}}$ was equivalent to 1/2
$\overline{\text{II}}\ \overline{\text{III}}$ was equivalent to 5/6
$\overline{\text{III}}\ \overline{\text{III}}$ was equivalent to 2/3

To avoid use of fractions they usually resorted to making secondary divisions of a unit where fractional parts were commonly encountered. For instance "ounce" and "inch" in English are akin in that they are both derived from the Latin word uncia, meaning a twelfth. The Roman libra, a pound, had 12 ounces as still do our troy and apothecaries systems of weights now used by jewelers and druggists respectively. The British (pound) mark is a relic of the word libra. They, and we too, did not express values such as 18 inches as 1½ foot but as one foot, six inches; 2⅓ pounds was two pounds four ounces, etc. You will note that we often do the same. It is much easier to conceive and express 12 hours 24 minutes in that form than to say 31/60 day or 12-2/5 hours.

During the entire period of Roman history, with all their advances in the fields of law and literature, their contributions to technology and mathematics were slight. In fact in some areas they lost or ignored the knowledge of the more ancient civilizations and it was not until the Renaissance (period of the rebirth of knowledge) that mathematics, and with it technology, began to advance again. The notebooks of Leonardo da Vinci contain more material conducive to the advancement of mechanics than the total known publications of Roman authors. Offhand I can think of but a few Roman contributions to technology—the use and development of the arch, concrete, highways and great water and sewage systems.

Your next question was "How did they multiply using that board with its dishes and a handful of stones?" You reasoned they couldn't have done it by multiple addition. To have multiplied a simple nine times four would have involved nine casts and a total of 36 stones with three moves to rectify the board, obviously too much of a job to be a practical computing process.

If they had known their multiplication tables up to ten they could have used them much as the Arabs later used the rod-and-bead abacus. To this day the Russians use the szczety, the Japanese the soroban and the Chinese the suan pan—all rod-and-bead computers.

In my opinion the teaching of multiplication tables to a young child as we do by senseless rote results in a mental trauma (wound, shock that lasts through life) and turns the average person against the study of mathematics from that time on. It is difficult for me at this moment to accept the fact that seven times eight is 56; somehow it doesn't sound logical.

It might be well to review the development of the multiplication tables and their use before going any farther.

Your VIC 20 uses the most simple table of all—that is, no table. It really knows only how to add ones and zeros. Since 0 + 0 = 0, 0 + 1 = 1 and 1 + 1 = 0 with a carry one this affects the following simple multiplication table:

0 times 0 = 0
0 times 1 = 0
1 times 0 = 0
1 times 1 = 1

You might say the Romans knew their tables through the two's as they were able to multiply a number by two or halve it "in their head." I will take up their use of this ability to affect the multiplication of large numbers in the latter part of the letter and include the program "Roman Method" to force the VIC 20 to use this system. The ability to mentally halve (especially when you can ignore any remainder) and double a number comes easily with a little practice as you will see after running the program "Roman Method" a few times.

This Roman system continued in use as long as Western Europe used Roman numerals in their computations.

As I told you in my last letter Roman numeral computations began to be displaced by the algorithmic (use of the Arabic numerals one through nine and the zero) during the tenth century. It was a slow but thorough process and by the 13th century Roman numerals were used only for "literary" purposes. The Arabic or Hindi numerals had replaced them in business as well as in scientific calculations.

It became necessary for the user of this algorithmic system to know the tables through the nine's. This was considered a prodigious feat of memory and put mathematics in the class of a "clerkly mystery." Many so far refused to learn them above the five's and for six through nine reverted to using the fingers of their two hands as a computer. The short program I have also included, "Finger Multiply", illustrates this mental crutch.

It is probably hard for you to conceive that many university graduates up to the middle of the 18th century were not able to multiply or divide large numbers. As a concrete example le me quote from the *Diary of Samuel Pepys*, in his youth a student at Cambridge, having already served several years as Clerk of Accounts for the British Admiralty and now over 30 years of age:

> **July 4, 1662**—Comes Mr. Cooper, mate of the Royall Charles, of whom I intend to learn mathematiques, and do begin with him today. After an houre's being with him at arithmetique, my first attempt to learn the multiplicacion-table.
>
> **July 9, 1662**—Up by four o'clock and at my multiplicacion-table which is all the trouble I meet with in all my arithmetique.

In ancient times in the Middle East the Babylonians, Chaldeans and Medes were using a combination base 12 and base 60 system. Mathematics belonged to a priesthood where it was possible to enforce learning by a rigid discipline. The priestly mathematicians must all have known the tables through 12 and most likely some actually knew them through the 60's. We are lucky to have retained some of this base for it had a logical backing much superior to the base ten which resulted from the accidental fact that human beings' first computer was a set of fingers and toes. Just think what a mess daily computations would be subjected to if we had a ten-hour day or a 100-degree circle. Exponents of the metric system usually forget to mention that ten is not easily factored, as any lumberman can tell you after he cuts a ten-by-ten. By the way our dozen-dozen is the gross, a shortening of the words "gross (great) hundred".

One other priesthood was that of the Central American Indians, Mayans and Aztecs, who used the base 20 and therefore had tables to that value. This vigesimal (base 20) system was sometime used in Europe, not so much in calculations as in rhetoric: witness the familiar "four score and seven years ago", "three score years and ten". Also the French quatre-vingts (80) and quatre-vingt-dix (90).

We have seen that the Romans could multiply by two and could divide by two without mechanical help. Let's see how they used this ability.

Many great mathematicians support an inspirational theory for great mathematical advances. Simply it means that after intensive thinking about a mathematical problem the solution will often "just come to" the mathematical mind and proof or basis may be found for its truth only years later. Among the many exponents of this theory we find Fibonacci, Newton, Leibnitz, Hamilton, Kronecker and Poincare. The idiot-savant (feebleminded-learned one) is often used as an example. Railroad Jack (his stage name) could repeat long lists of long numbers, add long sequences of numbers, even take square roots—and he could not explain how he did it nor could he dress himself without assistance.

The Romans used a binary system of multiplication with no knowledge of that fact and consequently never used it in other possible ways. Of course someone must have discovered it but who, when and how is not known. I will now demonstrate how it was used and begin with a very simple example.

Multiply IX (nine) times VIII (eight) to obtain a product of LXXII (72). The rules are:

1. Set up two columns, A and B
2. Write the multiplier in A, the multiplicand in B.
3. Successively divide column A by two.
Ignore remainders!!!!
Place a one after all odd values.
Place a zero after all even values.
Quit when the quotient is unity.
4. Across from each entry in column A place in column B two times the preceding value of B.
5. Draw a bar under the values.
Add only the values in column B preceded by a one.
6. Enter the sum as the derived product.

Col A			**Col B**		
IX	(9)	(1)	VIII	(8)	ADD
IIII	(4)	(0)	XVI	(16)	
II	(2)	(0)	XXXII	(32)	
I	(1)		LXIIII	(64)	ADD

The Product is: LXXII (72)

Now note the binary patterns formed. Read the bracketed numbers up in column A and you will find 1001 is the binary form of IX or nine. Read the bracketed value of column B down and you will find them to be the successive value of VIII (eight) times two to the nth power beginning with two to the zero-th. That is, eight equals eight times two to the zero-th; 16 equals eight times two to the first; 32 equals eight times two squared; 64 equals eight times two cubed.

One more to make sure you see the principle. XVIII (18) times XXII (22) = CCCXCVI (396):

Col A			**Col B**		
XVIII	(18)	(0)	XXII	(22)	
IX	(9)	(1)	XLIV	(44)	ADD
IV	(4)	(0)	LXXXVIII	(88)	
II	(2)	(0)	CLXXVI	(176)	
I	(1)	(1)	CCCLII	(352)	ADD

The product is CCCXCVI (396)

Notice that the binary equivalent of 18 is 10010 —read up last bracketed values in Column A. And that in Column B:

(22) = 22 times 2 to the zero-th power
(44) = 22 times 2 to the first power
(88) = 22 times 2 to the second power
(176) = 22 times 2 to the third power
(352) = 22 times 2 to the fourth power

So what the Romans were doing was multiplying 10010 (18) times 10110 (22) and finding 110001100 (396) as the product.

$$\begin{array}{rr} & 22 \\ \times & 18 \\ \hline & 196 \\ & 22 \\ \hline & 396 \end{array} \qquad \begin{array}{rr} & 10110 \\ \times & 10010 \\ \hline & 101100 \\ & 10110 \\ \hline & 110001100 \end{array}$$

And instead of having to make 18 casts of 22 stones they had to make only two casts—one for the 44 value and one for the 352. After running the program a few times it will become quite clear to you that you don't have to know your multiplication tables after all. And I do hope you don't take that seriously.

This letter has become much longer than I had intended but I hope that it gives you an insight into the problems of the mathematicians of older times and a feeling of how lucky you are to have your VIC 20 to help you do your "calculations."

Your grandfather. **C**

Roman Method

```
10 REM ''ROMAN-METHOD''
20 REM F H SHEDD 10/22/83
30 CL$=CHR$(147)
40 PRINT CL$ :PR=0
50 PRINT "ROMAN MULTIPLICATION"
60 PRINT "METHOD ILLUSTRATED "
70 PRINT "USING ARABIC NUMBERS"
80 PRINT
90 INPUT"[SPACE2]MULTIPLIER =";X
100 INPUT"MULTIPLICAND =";Y
110 PRINT
120 PRINT "A[SPACE5]B[SPACE5]C"
130 X1=X/2:Y1=2*Y
140 XI=INT(X1):D=X1-XI:O=0
    :PL$=" "
150 IF D THEN O=1:PL$="ADD"
    :PR=PR+Y
160 PRINT X;O;":[SPACE2]";Y;" ";
    PL$
170 IF XI>1 THEN X=XI:Y=Y1
    :GOTO 130
180 PR=PR+Y1
190 PRINT " 1";"[SPACE2]1";"
    :[SPACE2]";Y1;" ";"ADD"
200 PRINT"--------------------"
210 PRINT "PRODUCT =";PR
220 PRINT "READ UP COLUMN B"
230 PRINT "FOR BINARY VALUE"
240 PRINT "OF MULTIPLIER"
250 GOSUB 1000
260 GOTO 40
1000 PRINT:PRINT"PRESS SPACE BAR"
1010 GET A$:IF A$=""THEN 1010
1020 RETURN
```

```
******************************************
*   S-C-R-E-E-N  D-U-M-P                 *
******************************************
*                                        *
* ROMAN MULTIPLICATION                   *
* METHOD ILLUSTRATED                     *
* USING ARABIC NUMBERS                   *
*                                        *
*   MULTIPLIER =? 11                     *
* MULTIPLICAND =? 22                     *
*                                        *
* A     B     C                          *
*  11  1 :   22  ADD                     *
*  5  1 :   44  ADD                      *
*  2  0 :   88                           *
*  1  1 :   176  ADD                     *
* --------------------                   *
* PRODUCT = 242                          *
* READ UP COLUMN B                       *
* FOR BINARY VALUE                       *
* OF MULTIPLIER                          *
*                                        *
* PRESS SPACE BAR                        *
******************************************
```

```
SCREEN DUMP ''FINGER-MULTIPLY'' CONTINUED
******************************************
*   S-C-R-E-E-N  D-U-M-P                 *
******************************************
* TO ILLUSTRATE                          *
* THE FOREGOING                          *
*  8  TIMES  9  = 72                     *
* RIGHT HAND                             *
*   II                                   *
* ------                                 *
*  III                                   *
*                                        *
* LEFT HAND                              *
*   I                                    *
* ------                                 *
*  IIII                                  *
*                                        *
* ADD DOWN I'S                           *
* MULTIPLY BY 10                         *
* ADD PRODUCT OF                         *
* UP I'S                                 *
* RESULTING PRODUCT                      *
* IS 72                                  *
******************************************
```

```
********************************************
*   S-C-R-E-E-N  D-U-M-P                   *
********************************************
*                                          *
* MULTIPLY USING                           *
* FINGERS KNOWING                          *
* ONLY MULTIPLICATION                      *
*     TABLE                                *
* THRU 5 TIMES 5                           *
* PRESS SPACE BAR                          *
********************************************
```

```
********************************************
*   S-C-R-E-E-N  D-U-M-P                   *
********************************************
*                                          *
* FOR NUMBERS 6                            *
* THRU 9 ONLY                              *
*   MULTIPLIER =? 8                        *
* ON RIGHT HAND (RH)                       *
* PUT 3  FINGERS DOWN                      *
* ( 8  MINUS 5)                            *
*  2  FINGERS ARE UP                       *
* ( 5 MINUS 3 )                            *
*                                          *
* MULTIPLICAND =? 9                        *
* ON LEFT HAND (LH)                        *
* PUT 4  FINGERS DOWN                      *
* ( 9  MINUS 5)                            *
*  1  FINGERS ARE UP                       *
* ( 5 MINUS 4 )                            *
* ADD THE DOWN FINGERS                     *
* MULTIPLY THE UP                          *
* 10 TIMES THE SUM OF                      *
* OF THE DOWN FINGERS                      *
* PLUS THE PRODUCT OF                      *
* OF THE UP GIVES THE                      *
* THE DESIRED PRODUCT                      *
********************************************
```

```
********************************************
*   S-C-R-E-E-N  D-U-M-P                   *
********************************************
* MULTIPLICAND =? 150                      *
*                                          *
* A     B     C                            *
*  257  1 :   150  ADD                     *
*  128 0 :    300                          *
*  64  0 :   600                           *
*  32  0 :   1200                          *
*  16  0 :   2400                          *
*  8  0 :   4800                           *
*  4  0 :   9600                           *
*  2  0 :   19200                          *
*  1  1 :   38400  ADD                     *
* ---------------------                    *
* PRODUCT = 38550                          *
* READ UP COLUMN B                         *
* FOR BINARY VALUE                         *
* OF MULTIPLIER                            *
*                                          *
* PRESS SPACE BAR                          *
********************************************
```

```
********************************************
*   S-C-R-E-E-N  D-U-M-P                   *
********************************************
*                                          *
* ROMAN MULTIPLICATION                     *
* METHOD ILLUSTRATED                       *
* USING ARABIC NUMBERS                     *
*                                          *
*   MULTIPLIER =? 129                      *
* MULTIPLICAND =? 450                      *
*                                          *
* A     B     C                            *
*  129  1 :   450  ADD                     *
*  64  0 :   900                           *
*  32  0 :   1800                          *
*  16  0 :   3600                          *
*  8  0 :   7200                           *
*  4  0 :   14400                          *
*  2  0 :   28800                          *
*  1  1 :   57600  ADD                     *
* ---------------------                    *
* PRODUCT = 58050                          *
* READ UP COLUMN B                         *
* FOR BINARY VALUE                         *
* OF MULTIPLIER                            *
*                                          *
*                                          *
*                                          *
********************************************
```

Finger Multiply

```
10 REM ''FINGER-MULTIPLY''
20 REM 11/1/1983 F H SHEDD
30 REM REFERENCE ENCYCLOPEDIA
   BRITANNICA - FINGER
   MULTIPLICATION
90  CL$=CHR$(147)
100 PRINT CL$
120 PRINT "MULTIPLY USING[SPACE7]
    "
130 PRINT "FINGERS KNOWING "
140 PRINT "ONLY MULTIPLICATION"
150 PRINT "[SPACE4]TABLE"
160 PRINT "THRU 5 TIMES 5"
    :GOSUB 1000
170 PRINT "FOR NUMBERS 6 "
180 PRINT "THRU 9 ONLY"
200 INPUT "[SPACE2]MULTIPLIER =";
    A
210 I=A-5:J=5-I
220 PRINT "ON RIGHT HAND (RH)"
230 PRINT "PUT";I;" FINGERS DOWN"
240 PRINT "(";A;" MINUS 5)"
250 PRINT J;" FINGERS ARE UP"
260 PRINT "( 5 MINUS";I;")"
270 PRINT
280 INPUT "MULTIPLICAND =";B
290 X=B-5:Y=5-X
300 PRINT "ON LEFT HAND (LH)"
310 PRINT "PUT";X;" FINGERS DOWN"
320 PRINT "(";B;" MINUS 5)"
330 PRINT Y;" FINGERS ARE UP"
335 PRINT "( 5 MINUS";X;")"
337 PRINT
340 PRINT "ADD THE DOWN FINGERS"
350 PRINT "MULTIPLY THE UP"
360 PRINT "10 TIMES THE SUM OF"
370 PRINT "OF THE DOWN FINGERS"
380 PRINT "PLUS THE PRODUCT OF"
390 PRINT "OF THE UP GIVES THE"
400 PRINT "THE DESIRED PRODUCT"
410 Z=A*B:PRINT "[SPACE3]";Z
420 GOSUB 1000
430 PRINT "TO ILLUSTRATE"
440 PRINT "THE FOREGOING"
450 PRINT A;" TIMES ";B;" =";Z
455 PRINT
460 PRINT "RIGHT HAND":V=A
470 GOSUB 2000
475 PRINT
480 PRINT:PRINT "LEFT HAND":V=B
490 GOSUB 2000
500 PRINT:PRINT"ADD DOWN I'S"
520 PRINT "MULTIPLY BY 10"
530 PRINT "ADD PRODUCT OF"
540 PRINT "UP I'S"
550 PRINT "RESULTING PRODUCT"
560 PRINT "IS";Z
570 STOP
600 PRINT " IIII"
610 PRINT "------"
620 PRINT "[SPACE2]I"
630 RETURN
700 PRINT " III"
710 PRINT "------"
720 PRINT " II"
730 RETURN
800 PRINT "[SPACE2]II"
810 PRINT "------"
820 PRINT " III"
830 RETURN
900 PRINT "[SPACE2]I"
910 PRINT "------"
920 PRINT " IIII"
930 RETURN
1000 PRINT"PRESS SPACE BAR"
1005 GET A$:IF A$=""THEN 1005
1010 PRINT CL$
1020 RETURN
2000 IF V=6 THEN GOSUB 600
2010 IF V=7 THEN GOSUB 700
2020 IF V=8 THEN GOSUB 800
2030 IF V=9 THEN GOSUB 900
2040 RETURN
```

All You Need to Know to Begin Programming in Machine Language

Machine language programming on Commodore's 6502 microprocessor is not as difficult as you may have been led to believe. In this second and final part, John continues his explanation of techniques to help get you started on the road to machine language competence. Part 1 appeared in the June/July issue.

Part 2

By John J. Karcher

Building Programs

Fool Around. In Part 1 you were to practice little routines. The next step is to fit them together. So now we will do a short but more complex program and as we go along we will add more to it. With your assembler (I use *VicMon*) type this program then run it. Notice the speed.

Program 1.

```
1C00 LDX #$0D          ; X=0D
1C02 STX $900F         ; Change screen/border
                         colors to X
1C05 LDX #$00          ; X=0
1C07 TXA               ; A=X
1C08 STA $1E00,X       ; Store A in1E00+X (Screen
                         Memory)
1C0B INX               ; X=X+1
1C0C BNE $1C07         ; If X has not wrapped
                         around to 00 then goto
                         1C07
1C0E BRK               ; Stop the program
```

In this program, you might not know what certain locations do. Location $900F is 36879 in decimal. You've probably used it in BASIC; the screen/border colors are here. Location $1E00 is 7680 in decimal—the first byte of screen memory.

This program puts all 255 of the VIC's characters on the screen. But notice I said "puts" not "prints". This program uses POKE values not ASCII. But how could I print? No command says print to the screen.

The Kernal. The what? The Kernal is a "jump table". You JSR there to get the VIC to do other things like read the keyboard, print to the screen, open and close channels and set or read the clocks. When you print or read the keyboard, ASCII values are used for characters. You've probably used them also in BASIC. PRINT CHR $(X) will print a character when X is a legal value (0 to 255).

The Kernal activities are listed on pages 184 and 185 of the *VIC 20 Programmer's Reference Guide* and are described on pages 185 to 210 of the same guide. The Kernal is the same on the VIC and 64, which is quite handy if you have both. When you JSR to a Kernal routine, it does its job. An RTS is at the end of the subroutine so it automatically returns to your program (the instruction after the JSR, to be exact). Never JMP to a Kernal routine or you will never get back!

Sometimes you have to set A,X and/or Y before JSRing to a subroutine. For example, JSRing to $FFD2 will print the ASCII value *in the accumulator* to the screen. Because of this, one routine can print any character, depending on the accumulator.

Now for another program.

Program 2.

```
1C00 LDA #$41              ; Put ASCII "A" in A
1C02 JSR $FFD2             ; Print A on the screen
1C05 TAX                   ; X=A
1C06 INX                   ; X=X+1
1C07 TXA                   ; A=X
1C08 CMP #$5B              ; Compare A with ASCII
                             "Z"+1
1C0A BNE $1C02             ; If A<>ASCII "Z"+1 then
                             jump to 1C02
1C0C BRK                   ; Stop the program
```

This program prints the alphabet on the screen extraordinarily quickly. Try that in BASIC. But this gets boring quickly. So let's try color. Add Program 3 to Program 1.

Program 3.

```
1C0E LDX #$00              ; X=0
1C10 LDA #$02              ; A=2
1C12 STA $9600,X           ; Store A in 9600+X (Screen
                             color memory)
1C15 INX                   ; X=X+1
1C16 BNE $1C12             ; If X <> 0 then 1C12
1C18 BRK                   ; Stop the program
```

The characters are now red. Now let's read the keyboard.

Program 4.

```
1C00 JSR $FFE4             ; A=ASCII of the last key
                             pressed
~~1C03 BEQ $1C00~~         ; If A=0 (no key) then
                             jump to 1C00
```

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All You Need To Know *(Continued From Page 115)*

```
1C05 CMP #$0D              ; Compare A with 0D   CARRIAGE RET ?
1C07 BEQ $1C0F             ; If result =0 then jump
                             to 1C0F   BRK
1C09 JSR $FFD2             ; Print A
1C0C JMP $1C00             ; Jump to 1C00
1C0F BRK                   ; Stop the Program
```

Whatever you type now shows up on the screen. How do you get it to stop? Hit RETURN.

See how far we've gotten? From nothing to reading the keyboard, printing and POKEing.

Stopping It. The last program brings us to an interesting point. The program would never stop if the RETURN key routine were omitted. Let me explain this and a few other routines before going on.

In Program 4, 1C00 puts the key that was pressed into the accumulator. 1C03 compares A with OD (13 decimal) which is RETURN. 1C05 if the difference is zero then jump to BRK.

Changing OD to another value would stop the program if another key was hit. Another stop routine is:

```
1C03 JSR $FFE1
1C06 BEQ $1C0E
```

All location numbers after 1C08 will be one greater because this takes one more byte of memory. But how does it work? JSRing to FFE1 (another Kernal location) puts 00 in A and sets the zero flag if RUN/STOP is pressed.

Keep in mind to *always* be sure to have an exit and take it out only in the finished product if at all. If you don't have an exit routine you'll never stop the program unless you turn off the computer. These are not the only exit routines. You can even invent your own.

Repeat. The first and second programs introduced us to a concept of repeating. It's like FOR... TO... NEXT in BASIC. Here is the format:

LDX #$00
"Do job" *(The routine to be repeated goes here.)*
INX
BNE to "Do job"
For example:

```
LDX #$00                   ; X=0
NOP                        ; Delay
INX                        ; X=X+1
BNE to NOP                 ; If X scrolls back to 00
                             from FF then Goto NOP
BRK                        ; Stop the program
```

This is a time delay, like FORT=1TO100:NEXTT, only it uses less than one thousandth of a second in the delay. At this point try to write an alphabet-printing program (don't copy the second program). Give yourself time. Go over all the commands.

Program 5.

```
1C00 LDX #$00              ; X=0 (first letter of the
                             alphabet
1C02 TXA                   ; A=X
1C03 ADC #$41              ; A=A+$41 (convert to ASCII)
```

```
1C05 JSR $FFD2                ; Print A
1C08 INX                      ; X=X+1
1C09 CPX #$1A                 ; Compare X to $18 (the
                                character after Z)
1C0B BNE $1C02                ; If different, then Goto
                                1C02
Lc0D BRK                      ; Stop the program
```

That was mine. If yours is the same, super! If not but it still works, that's even better! Creativity is one of the most important tools a programmer can have. If yours didn't work, that's okay. We just started.

Not Until You Do. Sometimes you must wait until a key is pressed before the program goes on. Here is a delay routine like GETA$:IFA=""THEN...

```
JSR $FFE4
BEQ ↑
```

Nothing will happen until you hit a key. Try building a program that counts one digit every time you hit a key. It can stop at nine. I won't help this time.

Variables. You might have been thinking, "What kind of a program can I write with only three variables?" Not much of one. But you needn't limit yourself to three. The cassette buffer is empty space. Why not store extra numbers there? One reason is that it will be lost if you run the recorder. But why not the BASIC input buffer? If you don't use BASIC, this space will never be used. The keyboard buffer is another spot. But all these can be damaged if you run BASIC. Let's look at our *Programmer's Reference Guide* for areas. Nothing. Wait. Look at decimal 784-787 and 820-827. What does "???" mean? It means that the VIC doesn't use this space for anything. They are perfect for variable locations. The others are okay also, but only if you are careful.

How would you use these variables if the VIC only lets you use X,Y and A? Here is an example.

```
LDX $0310                     ; Put a variable in X
Do job
LDX $0311                     ; Put another variable
                                in X

Do job
etc.
```

Do you see what I did? I took the variable and put it in X and did what I would have done to the variable to X. What if X is being used? Simple. Just store X as another variable and go on from there. To change a variable INC or DEC it or put it in A and ADC or SBC to it.

Control. We are now going to program the VIC to move a block left or right on the screen using the cursor key.

Program 6.

```
1C00 LDA #$0D                 ; A=0D
1C02 STA $900F                ; Store A in 900F, screen/
                                border colors
```

(Continued On Page 118)

All You Need To Know

(Continued From Page 117)

```
~~1C05~~ LDA #$93       ; A=93 (Clear the screen
033C                      in ASCII)

~~1C07~~ JSR $FFD2      ; Print A
033E
~~1C0A~~ LDX #$45       ; X=45
0341
1C0C STX $1DFF       ; Store X in 1DFF
0343
1C0F JSR $FFE4       ; A=the key typed
0346
1C12 LDX $1DFF       ; X=contents of 1DFF

1C15 CMP #$0D        ; Compare A with 0D

1C17 BNE $1C1A       ; If the result is not
                       00, then branch to 1C1A

1C19 BRK             ; Stop the program

1C1A CMP #$9D        ; Compare A with 9D

1C1C BNE $1C25       ; If the result is not 0,
                       then branch to 1C25

1C1E JSR $1C30       ; Jump to 1C30 saving
                       return address (GoSub)

1C21 DEX             ; X=X-1

1C22 JMP $1C36       ; Jump to 1C36 (GoTo)

1C25 CMP #$1D        ; Compare A with 1D

1C27 BNE $1C0C       ; If the result is not 00,
                       then branch to 1C0C

1C29 JSR $1C30       ; Jump to 1C30 saving
                       return address (GoSub)

1C2C INX             ; X=X+1

1C2D JMP $1C36       ; Jump to 1C36 (GoTo)

1C30 LDA #$20        ; A=20 (Screen code for space)

1C32 STA $1E00,X     ; Store A in 1E00+X (screen
                       memory)

1C35 RTS             ; Jump to command after JSR
                       (Return)

1C36 LDA #$A0        ; A=A0 (screen code for
                       reverse space)

1C38 STA $1E00,X     ; Store A in 1E00+X (screen
                       memory)

1C3B JMP $1C0C       ; Jump to 1C0C (GoTo)
```

When making a new subroutine look over all the commands to see if you can shorten it. And remember to practice often. Practice is the first step to success.

Practice. When practicing, don't type in the whole program if it is long. Write each subroutine, test it then save it or write it down. If it doesn't work try to figure out what is wrong, change it and test it again. There could be more than one mistake.

Always set your variables before you test your subroutine. Otherwise you could condemn a good subroutine to the trash can. For example, suppose your subroutine takes a number out of a location and processes it to give you its sine. If there is no number the subroutine doesn't have a chance to work.

Convert to BASIC and Decimal

Extra Help. One reason I chose VicMon over other kinds of assemblers was that it has excellent editing capabilities. They call it a monitor (hence, Vic*Mon*) because it does these other things. One of particular consideration is the M command. This prints the contents of given locations (in hexadecimal, of course). Use this command to write the contents of your program on the screen. Write these down on paper. Convert these to decimal. Write these down also. Convert the starting and ending addresses of the program to decimal. Then put this data in a program like this—

```
FORW=START TO LAST:READA:POKEW,A:NEXT
```

The program data (the long string of small numbers) is put into a data statement. Program 1 would look like this—

```
10 FORW=5120 TO 5134: READA:
POKEW,A:NEXT
50000 DATA 162,13,142,15,157,162,0,
      138,157,0,30,235,209,249,0
```

You use the SYS statement to get into a machine language program. In this case you would use SYS5120. Do this in direct mode (without a line number) if you want to. But be sure to run the program before you do.

Also be sure to change all BRK's in the program to RTS's to return to BASIC. The decimal number for RTS is 96. (You'll have to change the last number in the data statement to 96.)

If you have a machine language monitor, this is all you need to know. You may read the rest of this section just in case you get caught without your monitor but you don't have to.

Without A Monitor. The theory is the same as above. However, you can't use the M command. You'll have to find a table of commands. There is one on pages 164 to 167 of the *Programmer's Reference Guide*. But this one is better for converting *from* numbers than converting *to* numbers. You'll have to look through the information on pages 143 to 161. Addresses are written like 1E00 in hexadecimal. Leave this in hexadecimal. When you store this in memory store 00 before 1E. Look at the fifth and sixth numbers in the above BASIC example program.

Branching. I explained earlier how to use branching, but not how it works. We must now work with the "number" after the branching command. This byte tells how far and in which direction the branch will be. You can branch 7F forward and 80 backward (127 and 128 in decimal).

It works like this. To branch forward, count up from 00. To branch backward, count down from 00 (through FF, FE, etc.). Count the number of bytes you want to branch then count off that many. Remember—only 7F forward and 80 backward. (Start counting from the byte that holds our "number".)

Another way of doing this (the same way but shorter) is to add (for forward) or subtract (for backward) from zero the number of bytes you want to branch.

For example, a 56 in this byte (the one after the branch instruction) will cause a 56-byte forward branch if the conditions are true. An FF will cause a one-byte backward branch if the conditions are true.

Remember, though, always branch to the beginning of a command not the middle of it. Look at these values—162, 132, 32. Branching to the first byte will give the command LDX #$84, while branching to the second will give STY $20, a zero page-mode instruction. See what a mess that would make?

To illustrate this point disassemble one of the above programs starting with 1C00. Then compare this to a disassembly starting at 1C01. See what I mean?

Storing It

Where You Store It. So far so good. But where do you put your program? In BASIC program memory, located at 1000 to 1DFF (4096 to 7679). The variable space is perfect for short subroutines if you obey the rules.

Protection. Something else you should know is how to protect your machine language programs. Protect them from what? From BASIC. If your machine language program is a subroutine from a BASIC program or vice versa, the two will have to share the memory space. The machine language program probably won't bother the BASIC one, but BASIC doesn't look where it's going. If a BASIC program muscles in on machine code territory where your program is stored, one will have to go. The winner is always the aggressor. There are three major ways to remedy this:

—Hide machine code before BASIC.
—Hide machine code after BASIC.
—Hide machine code inside BASIC.

1. Before BASIC. To do this you *must* change a very vital pointer. Locations 43 and 44 decimal tell the 6502 where BASIC space starts. Use these locations like the "number" after an absolute-mode command. Put the location at which you want BASIC to start in these locations and POKE the new start of BASIC to zero. Put the first two hexadecimal digits in the last byte and the last two digits in the first. Then start your program at 1000 (4096) Decimal) or around there. But remember, don't clobber BASIC now that you are the aggressor.

2. After BASIC. This time you change another pointer. Locations 55 and 56 are a pointer that holds the last available location for BASIC. This time you store machine code as close to 1DFF as possible. Change this pointer to the location before your first program location. But don't run into screen memory.

3. Inside BASIC. You don't have to worry about pointers this time. Instead, you put your program in REM statements. That's right. Fill a lot of REMs with "A"'s or "X"'s or whatever you want. Count how many bytes long your program is. Use one character for every byte. Then POKE the machine language program into memory. Where? Right around to find them. If you list the BASIC program, most of your letters will have been replaced with BASIC commands, different characters, etc. *Don't hit RETURN on these lines! And don't add any lines on or before these lines!*

Conception to Completion

Conception. Let's make a simple program that contains a wide variety of commands and does something graphic. How about one that lets you draw designs using the cursor keys? (Don't get high hopes from that description. The program lets you draw rows and columns of reverse spaces.)

Begin. First things first. What's more frustrating than a graphic screen full of letters that get in your way every time you make a move? (You don't have to answer this.) So let's clear the screen first. You know how; we've done it before.

```
1C00 LDA #$93
1C02 JSR $FFD2
```

Now how do we put a trail of clocks on the screen? We can STA them or PRINT them there. With printing, you can use the whole screen. Also, you don't have to change screen color. Better yet, since the cursor keys relate directly to the direction you are going, you don't have to do fancy programming. STAing is faster but it doesn't have the advantages of printing. So we'll print.

Since we are only going to be printing reverse spaces, why don't we just RVS ON in the beginning and then print spaces to get blocks? That way we save a little time (very little, but every millisecond counts). This is a good idea because JSR $FFD2 acts like PRINTA$; not PRINT A$. (See the semicolon?) Let's do it. Eighteen decimal is 12 hexadecimal.

```
1C05 LDA #$12
1C07 JSR $FFD2
```

Good. Now let's read the keyboard. Since the 197 (10) location (look on page 179 in the *Programmer's Reference Guide*) can't tell the difference between CRSR and CRSR or between CRSR and CRSR, we only have one choice (without fancy programming).

```
1C0A JSR $FFE4
1C0D BEQ $1C0A
```

See the section here titled "Not Until You Do" and page 192 of the *Programmer's Reference Guide* for an explanation of that routine.

Now, to check for our cursor keys. If you think that we'll have a series of CMP's and BEQ's, you are right. But, if you think each BEQ must go to a different subroutine, you are wrong. Remember when I told you that "...since the cursor keys relate directly to the direction you are going, you don't have to do fancy programming"? That wasn't a useless statement that I just used to build up enthusiasm for printing. It's the truth. Since, if you hit CRSR , ASCII code 145 (10) is in A, all you have to do is print it! JSR $FFD2 uses ASCII also!

```
1C0F CMP #$ID
1C11 BEQ $1C25
1C13 CMP #$9D
1C15 BEQ $1C25
1C17 CMP #$11
1C19 BEQ $1C25
1C1B CMP #$91
1C1D BEQ $1C25
1C1F JSR $FFE1
```

```
1C22 BNE $1C0A
1C24 BRK
```

I put in the 1C1F-1C24 routine so we could get out of the routine. To see how it works, see the section here titled "Stopping It" and page 206 in the *Programmer's Reference Guide*. Now we want to print our move...

```
1C25 JSR $FFD2
...And the block.
1C28 LDA #$20
1C2A JSR $FFD2
```

We're finished. Or are we? Add this line and run it.

```
1C2D JMP $1C0A
```

OOOPS!!! We forgot that when we print, the cursor is advanced. So we'll move it back one.

```
1C2D LDA #$9D
1C2F JSR $FFD2
1C32 JMP $1C0A
```

Now run it. It works! That's how you design small programs. As you get into long machine language programs you'll probably want to use flowcharts, but for now just write the programs on paper if you can't keep it all in your head.

Moving On

Keep Reading. There are innumerable valuable sources of information on programming in machine language. Practice and reading more information will make you as proficient at machine language as BASIC. Keep working! Who knows, you could be the next programming superstar!

Oh yes, when programmers refer to "hex", they mean hexadecimal. The only reason I didn't use this word is that to mathematicians it means "Base 6". C

John Karcher, age 15, is a home-schooled student who lives in Colmar, Pennsylvania.

Sprite Examples *(Continued From Page 98)*

```
770 B$="[RVOFF,SPACE11]":REM ROAD
775 X(1)=1:X(2)=-1:X(3)=0:X(4)=2
    :X(5)=-2:X(6)=0:K=0
780 PRINT "[CLEAR,DOWN5]"
785 P=PEEK(DC): REM CLEAR COLL.
    REG.
790 G=15-PEEK(56320)AND 15
795 DX=0
800 IF G=4 THEN DX=-5
810 IF G=8 THEN DX=5
820 POKE X0,(PEEK(X0)+DX)
830 PRINT A$;TAB(TB);B$:K=K+1
840 R=INT(RND(1)*6)+1:TB=TB+X(R)
    :IF TB<2 OR TB>21 THEN
    TB=TB-X(R)
850 IF PEEK(DC)=0 THEN 790
    :REM COLLISION?
860 POKE 53281,2:POKE 2040,0
870 FOR T=0 TO 150:NEXT
880 POKE 53281,0:POKE V+21,0
890 PRINT "[HOME,DOWN8,RIGHT5,
    RVS,WHITE,SPACE3]CRASHED !!!
    SCORE ==>"K"[LEFT,SPACE3]"
900 FOR T=0 TO 2000:NEXT:GOTO 90
910 REM
920 REM ***** SPRITE DATA *****
1000 DATA 0,0,0,0,0,0,0,0,0,0,0,
     0,0,127,128,0,193,128,0,205,
     128,1,205,128
1010 DATA 3,229,128,63,255,254,
     255,255,251,255,255,255,206,
     255,115,23,126,184
1020 DATA 31,0,248,29,0,232,14,0,
     112,0,0,0,0,0,0,0,0,0,0,0,0
1030 DATA 0,0,0,0,0,0,0,0,0,0,0,
     0,0,127,128,0,193,128,0,205,
     128,1,205,128
1040 DATA 3,229,128,63,255,254,
     255,255,251,255,255,255,206,
     255,115,29,126,232
1050 DATA 31,0,248,23,0,184,14,0,
     112,0,0,0,0,0,0,0,0,0,0,0,0
1060 DATA 0,0,0,3,255,192,61,255,
     188,61,255,188,63,195,252,
     36,231,36
1070 DATA 61,189,188,7,102,224,7,
     231,224,15,219,240,15,255,
     240,15,195,240
1080 DATA 7,231,224,7,231,224,7,
     126,224,1,189,128,0,219,0,
     15,126,240
1090 DATA 9,126,144,15,255,240,
     15,60,240
```

C

MERGER: A Disk Utility

For All Commodore Computers

By Neil Harris
Director/Publishing

Why I Wrote It

When programmers write software on large "mainframe" computers, they use libraries of small programs as building blocks. On microcomputers this isn't easy. There is no builtin function that lets you mix programs together. Even BASIC extensions like *Simons' BASIC* let you append a program after another but not merge them together.

This program takes two programs on disk and creates a third program. The result is a true merging of the programs, in which the line numbers are sorted into the correct order. If both programs contain lines with the same number, the line from the second program is used.

This was inspired, by the way, by a highly inefficient program that appeared in one of this magazine's competitors (the one with the short name). That program actually read both programs entirely into memory before creating the new program. This limits what you can do by decreasing the available memory.

My program only reads one line from each original program, then takes the line with the lower number and writes it to the new program. When running, it uses less than 1K. It works on any Commodore computer, including the VIC 20.

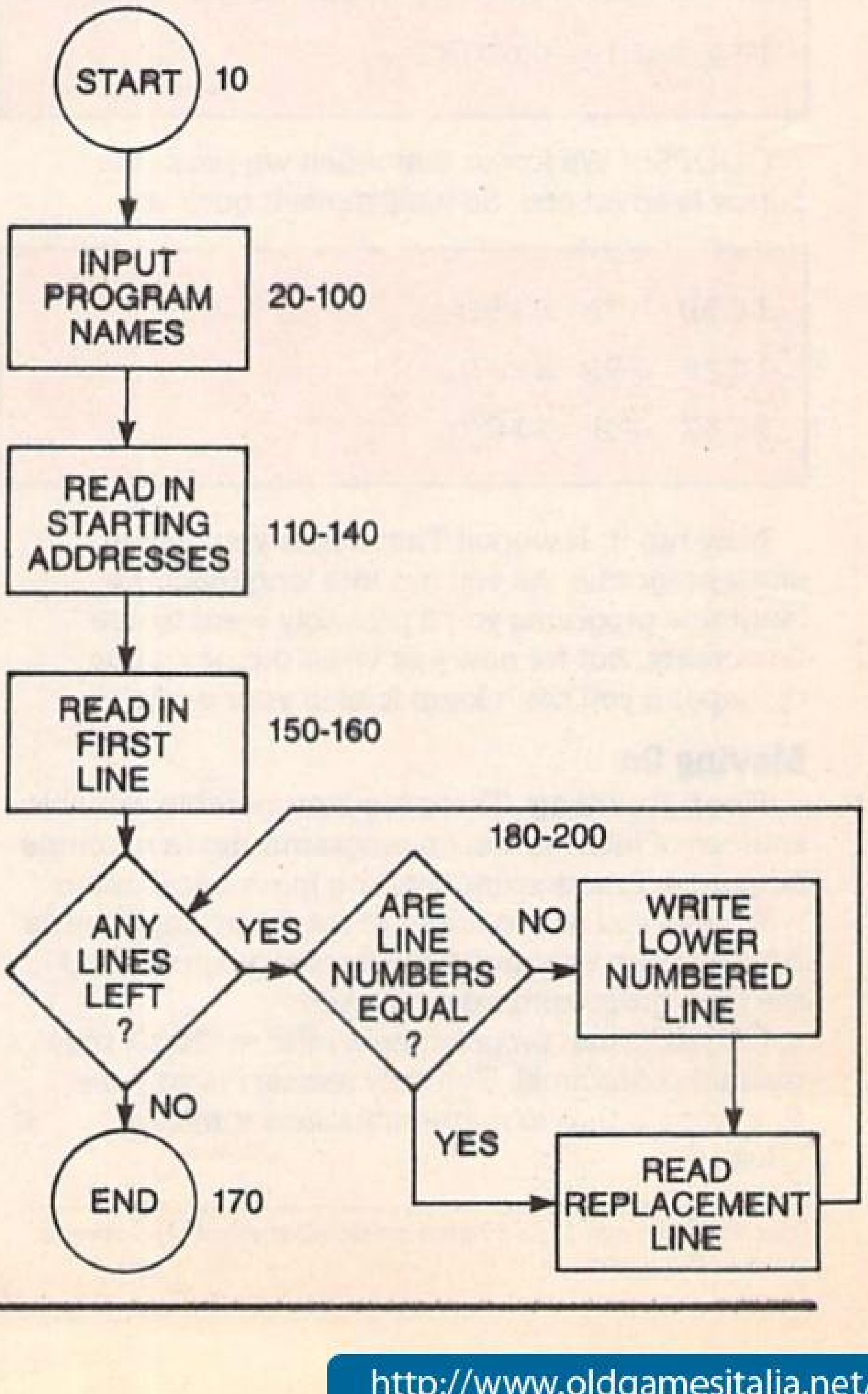
How It Works

To understand this program, you must first know what a program looks like, byte by byte, on the disk.

The first two characters in the program on the disk represent the memory location where the program begins. This tells the LOAD command where to start putting your program if you use the LOAD "name",8,1 format.

Now come the actual lines of the program. These start with two pairs of characters that represent the line number and the link to the next line. The link points to the first character in the following program line. The rest of the data include the commands, numbers, and other characters in the program line. Finally, the last character marking the end of the line is a CHR$(0).

"Merger" Flow Chart



As this program works, it throws away the links from the old programs and creates the correct new ones. It keeps track of the line pointer by storing the starting address in variable S in line 140, then adding the length of each new line to S in line 400.

The subroutine starting at line 300 is my "fetch a line" routine. It reads the next line from a program (the first one if A=0, the second if A=1). The line number is put into the Q array and the line goes into the P$ array. Q(0) is the next line number for the first program, while Q(1) is the line number for the second one.

The lines from 400 on are the "write a new line" routine. First the new link is written, then the line number, and finally the line itself and the CHR$(0).

Merger

```
10 REM --> MERGER BY NEIL HARRIS
   <---
20 PRINT"NAME OF ORIGINAL
   PROGRAM?"
30 INPUT A$
40 OPEN 1,8,2,"0:"+A$+",P,R"
50 PRINT"NAME OF MERGING
   PROGRAM?"
60 INPUT A$
70 OPEN 2,8,3,"0:"+A$+",P,R"
80 PRINT"NAME OF RESULT PROGRAM?"
90 INPUT A$
100 OPEN 3,8,4,"@0:"+A$+",P,W"
110 GET#1,A$,B$
120 GET#2,C$,D$
130 PRINT#3,A$B$;
140 S=ASC(A$+CHR$(0))+256*ASC
    (B$+CHR$(0))
150 A=1:GOSUB 300
160 A=2:GOSUB 300
170 IF L$(1)=""AND L$(2)=""THEN
    PRINT#3,CHR$(0)CHR$(0);
    :CLOSE 3:CLOSE 2:CLOSE 1:END
180 IF Q(2)<Q(1)THEN A=2
    :GOSUB 400:GOSUB 300:GOTO 170
190 IF Q(1)<Q(2)THEN A=1
    :GOSUB 400
200 A=1:GOSUB 300
210 GOTO 170
300 L$(A)=""
310 Q(A)=70000
320 GET#A,A$,B$,C$,D$
330 IF A$=""AND B$=""AND
    C$=""THEN RETURN
340 IF ST>0 THEN RETURN
350 Q(A)=ASC(C$+CHR$(0))+256*ASC
    (D$+CHR$(0))
360 GET#A,A$:IF A$=""OR
    A$=CHR$(13)THEN RETURN
370 L$(A)=L$(A)+A$
380 GOTO 360
400 S=S+5+LEN(L$(A)):W=INT(S/256)
    :PRINT#3,CHR$(S-256*W)CHR$(W)
    ;
410 PRINT S;Q(A)"[SPACE2]";
420 W=INT(Q(A)/256)
    :PRINT#3,CHR$(Q(A)-256*W)
    CHR$(W)L$(A)CHR$(0);
430 RETURN
```

c

user groups

Because our user group listing has become excessively long, we are now publishing only a partial list in each issue. This time we've included all our user groups in states beginning with letters A through M. Next issue we'll publish all the groups in states beginning with letters N through W and all foreign groups. Then the following issue, it's back to A through M, and so on, until we get so many that we have to publish it in three—or four—or more—parts.

User Group Listing

ALABAMA

Huntsville PET Users Club
9002 Berclair Road
Huntsville, AL 35802
Contact: Hal Carey
Meetings: every 2nd
Thursday

Riverchase Commodore
Users Group
617 Grove St.
Birmingham, AL 35209
(205) 988-1078
Ken Browning

Wiregrass Micro-Computer
Society
Commodore SIG
109 Key Bend Rd.
Enterprise, AL 36330
(205) 347-7564
Bill Brown

Tiger Byte: E. Alabama
CBM 64
Users Group
c/o The Computer Store, Inc.
Midway Plaza
Opelika, AL 36801
Jack Parsons
1st & 3rd Wed. of Month

The Birmingham Commodore
Computer Club
Birmingham, AL
(205) 923-9260
Harry Jones

Commodore Club of Mobile
3868-H Rue Maison
Mobile, AL 36608
(205) 343-1178
Tom Wyatt
3rd Thurs. of month

Shoals Commodore Users
Group (SCUG)
209 Lakeshore Dr.
Muscle Shoals, AL 35661
Geo. Taylor
2nd & 4th Tues. of month

1920-A Avenue C
Brookly
Mobile, AL 36615
(205) 661-1973
Howard Crider

CC & Me
P.O. Box 324
Pinson, AL 35126
(205) 854-0650
Bill Freeman

1734 S. Atmore Ave.
Whistler, AL 36612
(205) 452-9740
William Autry

ALASKA

COMPOOH-T
c/o Box 118
Old Harbor, AK 99643
(907) 286-2213

Alaska 84 Computer Club
c/o Line 49 Management
P.O. Box 6043
Anchorage, AK 99502

First City Users Group
P.O. Box 6692
Ketchikan, AK 99901
(907) 225-5695
James Llanos

ARIZONA

VIC Users Group
2612 E. Covina
Mesa, AZ 85203
Contact: Paul Muffuletto

Catalina Commodore
Computer Club
2012 Avenida Guillermo
Tucson, AZ 85710
(602) 296-6766
George Pope
1st Tues. 7:30 p.m.

Central Arizona PET People
842 W. Calle del Norte
Chandler, AZ 85224
(602) 899-3622
Roy Schahrer

ACUG
c/o Home Computer Service
2028 W. Camelback Rd.
Phoenix, AZ 85015
(602) 249-1186
Dan Deacon
First Wed. of month

West Mesa VIC
2351 S. Standage
Mesa, AZ 85202
Kenneth S. Epstein

Arizona VIC 20-64 Users Club
232 W. 9th Place North
Mesa, AZ 85201
Donald Kipp

Arizona VIC & 64 Users
904 W. Marlboro Circle
Chandler, AZ 85224
(602) 963-6149
Tom Monson

Canyon De Chelly—Four
Corners Users Group
c/o Calumet Consulting
Box 1945
Chinle, AZ 86503
(602) 674-3421
Larry DiLucchio
they meet bi-monthly

ARKANSAS

Commodore/PET Users Club
Conway Middle School
Davis Street
Conway, AR 72032
Contact: Geneva Bowlin

Booneville 64 Club
c/o A. R. Hederich
Elementary School
401 W. 5th St.
Booneville, AR 72927
Mary Taff

The Siloam Commodore
Computer Club
P.O. Box 88
Siloam Springs, AR 72761
(501) 524-5624
Ken Emanualson

Russellville Commodore
User Group
401 S. Arlington Dr.
Russellville, AR 72801
(501) 967-1868
Bob Brazeal

Arkansas River Valley
Commodore Users
401 S. Arlington Dr.
Russellville, AR 72801
(501) 967-1868
Bob Brazeal

P.I.C. Club
c/o Hatfield Public Schools
Box 130
Hatfield, AR 71945
(501) 389-6164
Bob Reed

CALIFORNIA

SCPUG Southern California
PET Users Group
c/o Data Equipment
Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
(213) 923-9361
Meetings: First Tuesday of
each month

California VIC Users Group
c/o Data Equipment
Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
(213) 923-9361
Meetings: Second Tues. of
each month

Valley Computer Club
1913 Booth Road
Ceres, CA 95307

PUG of Silicon Valley
22355 Rancho Ventura Road
Cupertino, CA 95014

Lincoln Computer Club
750 E. Yosemite
Manteca, CA 95336
John Fung, Advisor

PET on the Air
525 Crestlake Drive
San Francisco, CA 94132
Max J. Babin, Secretary

PALS (Pets Around)
Livermore Society
886 South K
Livermore, CA 94550
(415) 449-1084
Every third Wednesday
7:30 p.m.
Contact: J. Johnson

SPHINX
7615 Leviston Ave.
El Cerrito, CA 94530
(415) 527-9286
Bill MacCracken

San Diego PUG
c/o D. Costarakis
3562 Union Street
(714) 235-7626
7 a.m.-4 p.m.

Walnut Creek PET
Users Club
1815 Ygnacio Valley Road
Walnut Creek, CA 94596

Jurupa Wizards
8700 Galena St.
Riverside, CA 92509
781-1731
Walter J. Scott

The Commodore Connection
2301 Mission St.
Santa Cruz, CA 95060
(408) 425-8054
Bud Massey

San Fernando Valley
Commodore Users Group
21208 Nashville
Chatsworth, CA 91311
(213) 709-4736
Tom Lynch
2nd Wed. 7:30

VACUUM
277 E. 10th Ave.
Chico, CA 95926
(916) 891-8085
Mike Casella
2nd Monday of month

South Bay Commodore
Users Group
1402 W. 218th St.
Torrance, CA 90501
Contact: Earl Evans

Slo VIC 20/64 Computer Club
1766 9th St.
Los Osos, CA

The Diamond Bar R.O.P.
Users Club
2644 Amelgado
Haciendo Hgts., CA 91745
(213) 333-2645
Don McIntosh

Commodore Interest
Association
c/o Computer Data
14660 La Paz Dr.
Victorville, CA 92392
Mark Finley

Fairfield VIC 20 Club
1336 McKinley St.
Fairfield, CA 94533
(707) 427-0143
Al Brewer
1st & 3rd Tues. at 7 p.m.

Computer Barn
Computer Club
319 Main St.
Suite #2
Salinas, CA 93901
757-0788
S. Mark Vanderbilt

Humboldt Commodore Group
P.O. Box 570
Arcata, CA 95521
R. Turner

Napa Valley Commodore
Computer Club
c/o Liberty Computerware
2680 Jefferson St.
Napa, CA 94558
(707) 252-6281
Mick Winter
1st & 3rd Mon. of month

S.D. East County C-64
User Group
6353 Lake Apopka Place
San Diego, CA 92119
(619) 698-7814
Linda Schwartz

Commodore Users Group
4237 Pulmeria Ct.
Santa Maria, CA 93455
(805) 937-4174
Gilbert Vela

Bay Area Home
Computer Asso.
1332 Pine St.
Walnut Creek, CA 94598
(415) 932-5447
Cliff Downing

Amateurs and Artesians
Computing
P.O. Box 682
Cobb, CA 95426

Manteca VIC 20 Users
Organization
429 N. Main St.
Manteca, CA 95336
Gene Rong

Pomona Valley Commodore
Users Group
1401 W. 9th, #77
Pomona, CA 91766
(714) 620-8889
Mark Joerger
1st & 3rd Wed.
of month 7 p.m.

VIC TORII-The VIC 20
Users Group
PSC #1, Box 23467
APO San Francisco, CA 96230
Wesley Clark

The Valley Computer Club
2006 Magnolia Blvd.
Burbank, CA 91506
1st Wed. 7 p.m.

The Commodore Tech. Users
of Orange Co.
P.O. Box 1497
Costa Mesa, CA 92626
(714) 731-5195
Roger Fisher

VIC 20 Software
Exchange Club
10530 Sky Circle
Grass Valley, CA 95945
Daniel Upton

C-64 West Orange County
Users Group
P.O. Box 1457
Huntington Beach, CA 92647
(714) 842-4484
Philip Putman
2nd & 4th Tues. of month

Antelope Valley Commodore
Users Group
POB 4436
Lancaster, CA 93539
(805) 942-2626
James Haner
1st Saturday

Diablo Valley Commodore
Users Group
762 Ruth Dr.
Pleasant Hill, CA 94523
(415) 671-0145
Ben Braver
2nd & 4th Thurs. 7:30 p.m.

CA. Area Commodore
Terminal Users Society
C.A.C.T.U.S.
P.O. Box 1277
Alta Loma, CA 91701
Darrell Hall

20/64
P.O. Box 18473
San Jose, CA 95158
(408) 978-0546
1st Sun. of month (6-9 p.m.)

8120 Sundance Dr.
Orangevale, CA 95662
(916) 969-2028
Robyn Graves

Software 64
353 California Dr.
Burlingame, CA 94010
(415) 340-7115
Mario Abad

Sacramento Commodore
Users Group
8120 Sundance Dr.
Orangevale, CA 95662
(916) 969-2028
Robyn Graves

Peninsula Commodore
Users Group
549 Old County Rd.
San Carlos, CA 94070
(415) 593-7697

Timothy Very
2nd Thurs. of Month

San Francisco Commodore
Users Group
278-27th Ave. #103
San Francisco, CA 94121
(415) 387-0225
Roger Tierce

South Bay Commodore 64
Users Group
P.O. Box 3193
San Ysidro, CA 95073

Commodore 64 West
Computer Club
2917 Colorado Ave.
Santa Monica, CA 90404
(213) 828-9308
Don Campbell

Sixty Fourum
P.O. Box 16098
Fresno, CA 93755
John Damiano

C-64/VIC 20 Users Group
Pasadena City College
Cicadian Room
Pasadena, CA
(714) 593-4880
Chuck Cypher
7 p.m. 1st & 3rd Thursdays

Marin Commodore
Computer Club
620 Del Ganado Rd.
San Rafael, CA
(415) 479-0426
2nd Wed. of month 7:30 p.m.

Santa Rosa Commodore 64
Users Group
333 East Robles Ave.
Santa Rosa, CA 95407
(707) 584-7009
Garry Palmer
meets once a month

The Exchange
P.O. Box 9189
Long Beach, CA 90810
(213) 595-1771
Michael C. Joseph, MD

Southern California Edison
Commodore Club
P.O. Box 800
Rosemead, CA 91770
Jerry Van Norton

LOGIKS Commodore
Computer Club
c/o Christ Presbyterian
Church
620 Del Ganado Rd.
San Rafael, CA 94903
(415) 479-0426
Elmer Johnson
2nd Wed. of month 7:30 pm

Commodore 64 West
P.O. Box 346
Culver City, CA 90232
(213) 398-0913
Charles P. Santos

Commodore Users Group of
Riverside (CUGR)
P.O. Box 8748
Riverside, CA 92515
(714) 689-1452
Ken Brown
2nd & 4th Thurs. night

VIC-Club: San Francisco
(VCSF)
1503A Dolores
San Francisco, CA 94110
Colin Johnston
ages 10 to 16 preferred.

SIG (Special Interest Group)
1135 Coronet Ave.
Pasadena, CA 91107
Brian R. Klotz

VIC 20 Software Exchange
7660 Western Ave.
Buena Park, CA 90620
Vincent Beltz

COLORADO

VICKIMPET Users Group
4 Waring Lane,
Greenwood Village
Littleton, CO 80121
Contact: Louis Roehrs

Colorado Commodore
Computer Club
2187 S. Golden Ct.
Denver, CO 80227
986-0577
Jack Moss
Meet: 2nd Wed.

Commodore Users Group
Box 377
Aspen, CO 81612
(303) 925-5604
Ray Brooks
1st Monday in the evenings

Vicdore Users Group
326 Emery Dr.
Longmont, CO 80501
(303) 772-2821
Wayne Sundstrom

CONNECTICUT

John F. Garbarino
Skiff Lane Masons Island
Mystic, CT 06355
(203) 536-9789

Commodore User Club
Wethersfield High School
411 Wolcott Hill Road
Wethersfield, CT 06109
Contact: Daniel G. Spaneas

VIC Users Club
c/o Edward Barszczewski
22 Tunxis Road
West Hartford, CT 06107

New London County
Commodore Club
Doolittle Road
Preston, CT 06360
Contact: Dr. Walter Doolittle

The Commodore East
Users Group
165 B S. Bigelow Rd.
Hampton, CT 06247
(203) 455-0108

Commodore Users Group
of Stratford
P.O. Box 1213
Stratford, CT 06497
(203) 377-8373
Dan Kern-Ekins

Capitol Region Commodore
Computer Club
57 Carter Dr.
Tolland, CT 06084
Prudence Schifley
2nd Mon. of month 7 p.m.

CT Computer Society
180 Bloomfield Ave.
Hartford, CT 06105
(203) 233-3373
Harry Hill
last Sat. of month

Fairfield County Commodore
Users Group
P.O. Box 212
Danbury, CT 06810
Linda Retter

DELAWARE

The Diamond State
Users Group
Box 892, RD 2
Felton, DE 19943
(302) 284-4495
Michael Butler

Newark Commodore Users
Group (NCUG)
210 Durso Dr.
Newark, DE 19711
(302) 737-4686
Bob Black
once a month Newark H.S.

DISTRICT OF COLUMBIA

USO Computer Club
USO Outreach Center
207 Beyer Rd., SW
Washington, DC 20332
Steven Guenther

FLORIDA

Jacksonville Area
PET Society
401 Monument Road, #177
Jacksonville, FL 32211

Richard Prestien
6278 SW 14th Street
Miami, FL 33144

South Florida
PET Users Group
Dave Young
7170 S.W. 11th
West Hollywood, FL 33023
(305) 987-6982

PETs and Friends
129 NE 44 St.
Miami, FL 33137
Richard Plumer

Sun Coast VICs
P.O. Box 1042
Indian Rocks Beach, FL
33535
Mark Weddell

Bay Commodore
Users Group
c/o Gulf Coast Computer
Exchange
241 N. Tyndall Pkwy.
P.O. Box 6215
Panama City, FL 32401
(904) 785-6441
Richard Scofield

Gainesville Commodore
Users Club
3604-20A SW 31st Dr.
Gainesville, FL 32608
Louis Wallace

Brandon Users Group
108 Anglewood Dr.
Brandon, FL 33511
(813) 685-5138
Paul Daugherty

Brandon Commodore
Users Group
414 E. Lumsden Rd.
Brandon, FL 33511

Gainesville Commodore
Users Group
Santa Fe Community College
Gainesville, FL 32602
James E. Birdsell

Commodore Computer Club
P.O. Box 21138
St. Petersburg, FL 33742
(813) 522-2547
Chuck Fechko

Commodore Users Group
545 E. Park Ave.
Apt. #2
Tallahassee, FL 32301
(904) 224-6286
Jim Neill

The Commodore Connection
P.O. Box 6684
West Palm Beach, FL 33405

El Shift OH
P.O. Box 548
Cocoa, FL 32922
Mike Schnoke
Sat. mornings/every 4 to
6 weeks

Miami 20/64
12911 S.W. 49th St.
Miami, FL 33175
(305) 226-1185

Tampa Bay Commodore
Computer Club
10208 N. 30th St.
Tampa, FL 33612
(813) 977-0877

Commodore Computer Club
P.O. Box 9726
Jacksonville, FL 32208
(904) 764-5457
David Phillips
2nd & 4th Tues. of Month

VIC/64 Heartland Users
Group
1220 Bartow Rd. #23
Lakeland, FL 33801
(813) 666-2132
Tom Keough
4th Wed. of Month at PRC

64 Educators Users Group
South
FDLRS-South
9220 S.W. 52nd Terrace
Miami, FL 33165
(305) 274-3501
Dr. Eydie Sloane

64 Educators Users Group
North
16330 N.E. 2nd Ave.
North Miami Beach, FL 33162
(305) 944-5548
Robert Figueroa

Suncoast 64S
c/o Little Professor
Book Center
2395 U.S. 19 North
Palm Harbor, FL 33563
(813) 785-1036
Curtis Miller

Lakeland VIC 20 Users Group
2450 Shady Acres Dr.
Mulberry, FL 33860

Broward Commodore
Users Group
13 Spinning Wheel Lane
Tamarac, FL 33319
(305) 726-4390
Lewis Horn

Volusia Ct. Commodore
Program Exchange
1612 Reynolds Rd.
DeLeon Springs, FL 32028
Rick Stidham

The Ultimate 64 Experience
5740 S.W. 56th Terrace
Miami, FL 33143
Sandy Cueto

Clearwater Commodore Club
1532 Lemon St.
Clearwater, FL 33516
(813) 442-0770
Gary Gould

The Commodore Advantage
P.O. Box 18490
Pensacola, FL 32523
(904) 456-6554
Deanna Owens
2nd Friday of month

GEORGIA

VIC Educators Users Group
Cherokee County Schools
110 Academy St.
Canton, GA 30114
Dr. Al Evans

Bldg. 68, FLETC
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Vern Rotert

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Jorge Montalvan

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Pat Foley
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June/July, 1984
Screen shots

Much to our chagrin we forgot to give credit to photographer Tom McNamara for his screen shots in this issue. For the record, Tom did the shots for all the game reviews, the Commodore Challenge, the game program listings, all the features and the listings in Kids' Corner.

June/July, 1984
"Houseplant"
By Marilyn Sallee

This program is for the VIC 20, not the Commodore 64 as we had indicated. Sorry, folks. It's all because Jim Gracely wasn't here the day we were putting the magazine together. A version for the 64 will appear in a future issue.

June/July 1984
"Automatic VIC 20 Disk Starter"
By Stephen Leven

On page 108, under the subhead "Enter the Menu", the command LOAD":*",8:<SHIFT-RUN/STOP> does not require a <RETURN>, says Mr. Leven. Also, in that same article on page 110 there is a box in the righthand column titled "Adding VIC MENU as the First Program..." In items 2, 3 and 4 in that box the command lines are in error. In each command line the letter "O" was substituted for the numeral zero. So change RO to R0, CO to C0 and SO to S0 in items 2, 3 and 4 respectively.

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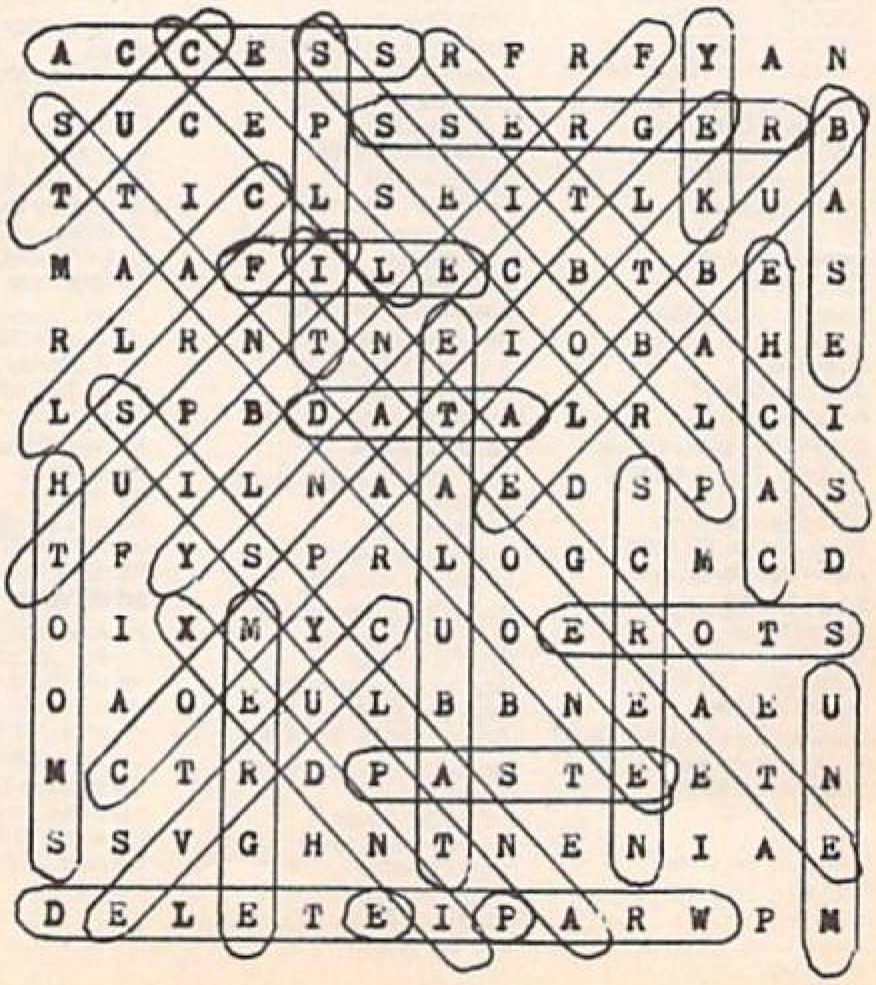

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"The world's largest manufacturer of Commodore accessories."

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HOW TO BECOME COMPUTER LITERATE.

FEATURES	COMMODORE 64™	APPLE IIe™	IBM PC jr™	ATARI 800XL™
Price*	$219	$699	$669	$299
Built-in Memory	64K	64K	64K	64K
Typewriter Keyboard	YES (66 Keys)	YES (62 Keys)	"CHICKLET" (62 Keys)	YES (61 Keys)
Upper/Lower Case	YES	YES	YES	YES
Programmable Function Keys	YES	NO	YES	NO
AUDIO				
Polyphonic Tones	YES	NO	YES	YES
Music Synthesizer	YES	NO	NO	NO
Hi-Fi Output	YES	NO	YES	YES
VIDEO				
TV Output	YES	EXTRA COST	EXTRA COST	YES
Video Monitor Output	YES	YES	EXTRA COST	YES
INPUT/OUTPUT				
Intelligent I/O Bus	YES	NO	NO	YES
RS-232 Communications	YES**	EXTRA COST	YES**	EXTRA COST
"Smart" Peripherals	YES	NO	NO	YES

*Prices shown are common retail and may vary slightly in different markets.

**Requires an adapter to operate.

First you need the right input.

Like $219. That's what the Commodore 64™ costs. It's about one third the price of the Apple IIe™ or the IBM® PCjr.™

And 64K. That's how much memory the Commodore 64 has. It's also how much memory Apple IIe and the IBM PCjr have.

This computer lesson is brought to you as a public service by Commodore (certainly not by Apple or IBM), the only computer company that can afford to show you a chart like the one above.

But what you can't see above are the thousands of software programs that make the Commodore 64 fully capable of doing anything any "triple the price" computer can do; for fun or profit, for every member of the family; anything from soccer to spread sheets to space exploration.

Because the Commodore is so affordable, you can load up on Commodore peripherals. Like a disk drive, a printer or a telephone modem. All together they cost just a tad more than an IBM PCjr by itself. With no peripherals.

No wonder Commodore sells more computers than Apple and IBM combined.

commodore COMPUTERS

IT'S NOT HOW LITTLE IT COSTS, IT'S HOW MUCH YOU GET.